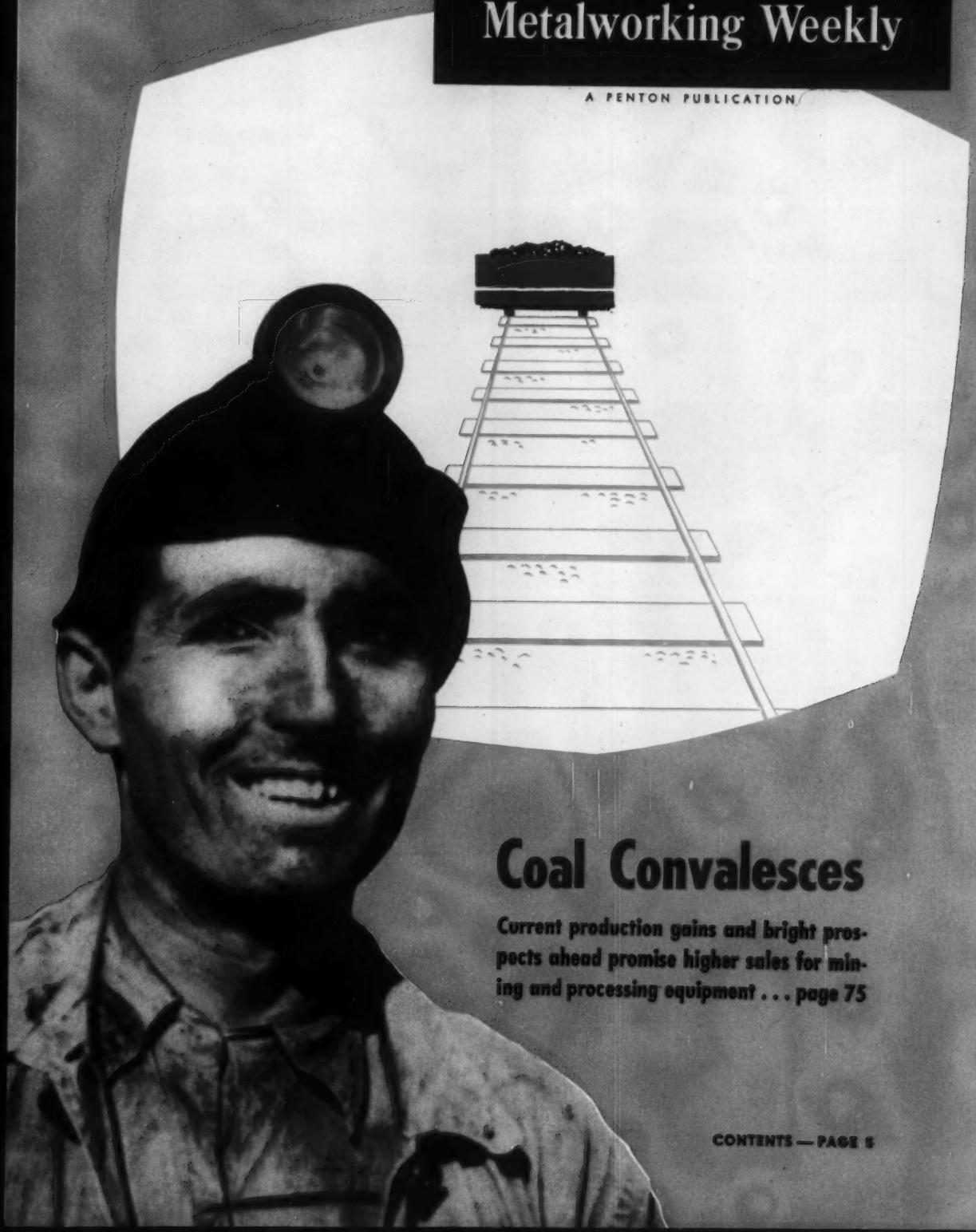
FEBRUARY 6, 1956

STEEL
The Metalworking Weekly

A PENTON PUBLICATION



Coal Convalesces

Current production gains and bright prospects ahead promise higher sales for mining and processing equipment . . . page 75

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A Metallurgist?

WHO? ME?

Well, maybe not exactly, but if you buy steel it's important that you, as a Purchasing Agent, know many details for which your technical contemporaries usually get the credit. Your knowing certain fundamentals can save your company many dollars and shorten delivery time by weeks.

As a case in point, take tubing size. A recent heat exchanger job called for three pieces of 18-8 Ti (TP321) tubing, each with different diameters and lengths. They were odd sizes, not available in stock. Delivery time would have been eight to ten weeks, and the customer would have had to buy minimum mill quantities, or four times more material than he wanted.

This smart customer (1) called in helpful Mr. Tubes, (2) converted to available pipe sizes while maintaining the original working pressures, (3) purchased a more expensive grade and still saved money, (4) cut delivery to less than four weeks, (5) stayed within his original cost estimate.

You don't have to be a metallurgist to realize that a basic understanding of tubing—plus a timely assist from Mr. Tubes, your link to B&W—can often save both time and money.

THE BABCOCK & WILCOX COMPANY
TUBULAR PRODUCTS DIVISION
General Offices: **Beaver Falls, Pennsylvania**
Plants: **Beaver Falls, Pa.; Alliance, Ohio; Milwaukee, Wis.**
Seamless and Welded Tubing and Pipe, Seamless Welding Fittings and Flanges—in Carbon, Alloy and Stainless Steels

B&W TUBULAR PRODUCTS DIVISION

TA-5069G

High Style in Steel

Many's the elegant home that is graced with furniture fabricated from hot-rolled carbon-steel bars.

Sturdy and durable, steel furniture has long been popular in the garden and on the porch, as well as in business offices.

In recent years, however, the artistic creations of such manufacturers as John B. Salterini Co., Inc., have brought high style to steel furniture, with the result that it has come into wide use in the home.

In Salterini's New York City workshops artisans bend, hammer and weld Bethlehem carbon-steel bars into creations that are as fashionable as they are functional. Some designs are modern, with clean, flowing lines. Others, such as the gracious French Provincial group shown above, are richly ornamented adaptations of traditional designs.

Bars for industries are hot-rolled on the Bethlehem bar mills at Lackawanna, N. Y., and Johnstown, Pa.

The furniture industry is but one of the innumerable active and growing industries whose combined requirements have created an unprecedented peacetime demand for hot-rolled carbon-steel bars. We're doing our best to meet this demand, all the while maintaining our customary quality standards.

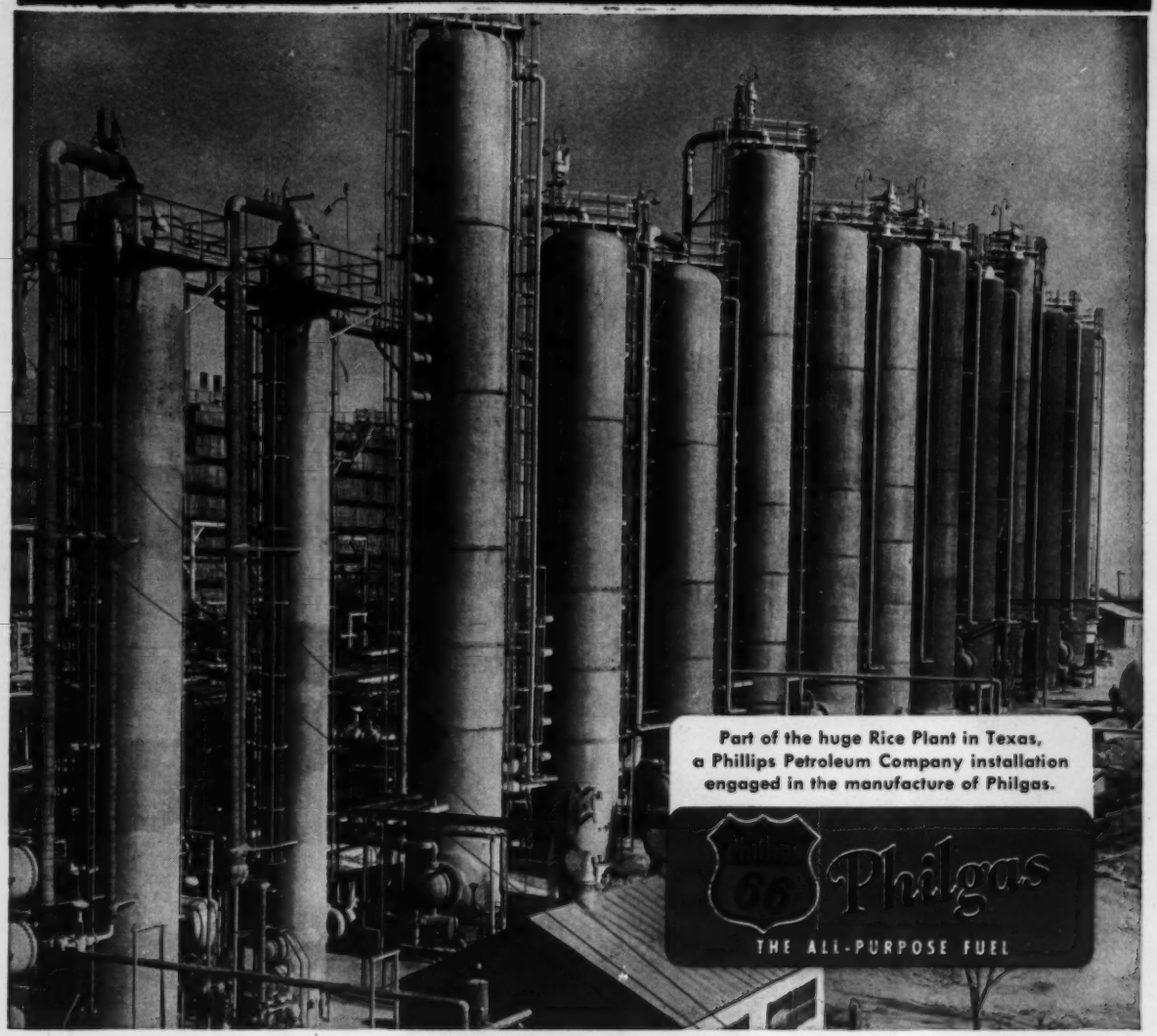
BETHLEHEM STEEL COMPANY
BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

BETHLEHEM STEEL

Philgas® IS AMERICA'S LARGEST SELLING LP-GAS



Part of the huge Rice Plant in Texas, a Phillips Petroleum Company installation engaged in the manufacture of Philgas.

PHILLIPS MODERN MANUFACTURING AND STORAGE FACILITIES ASSURE YOU A HIGH QUALITY PRODUCT

Phillips modern facilities and strict standards of production are your assurance of the purity, uniformity and high thermal value of Philgas. Phillips vast storage capacity helps assure you of dependable, year-around supply. Phillips also maintains its own fleet of tank cars and trucks to provide prompt deliveries.

Philgas is a clean-burning LP-Gas with uniform thermal values and gravity. It is free from harmful contaminants. With Philgas you can have automatic systems with constant, easily controlled operations. Write for information. Find out why many leading industries are using Philgas to turn out better products and, at the same time, cut operating expenses.

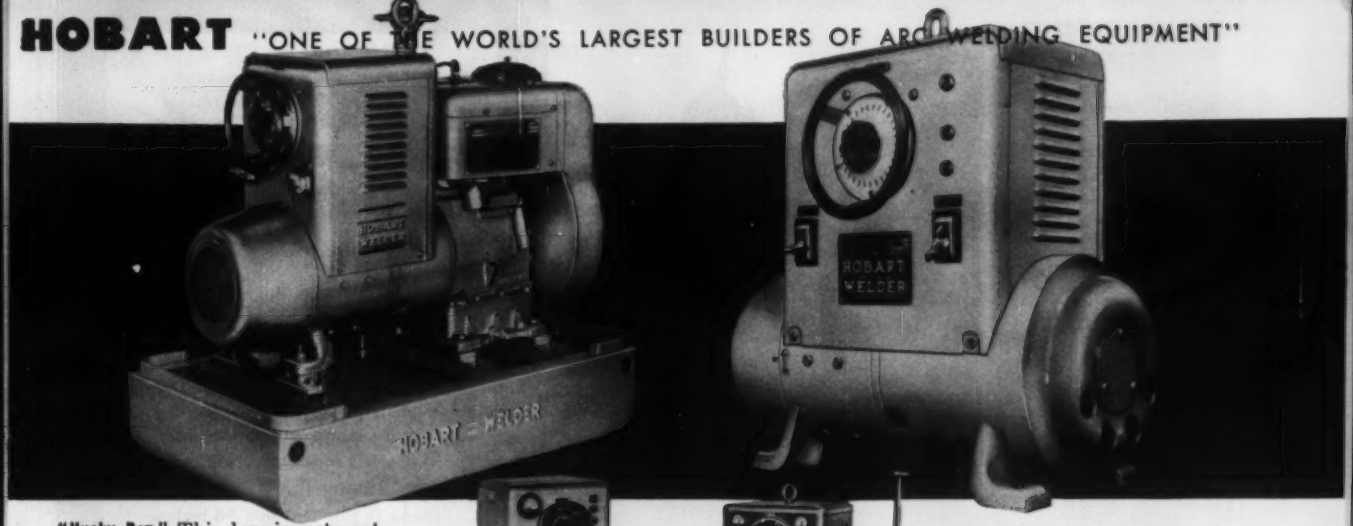
® Philgas is our name for high quality LP-Gas—Bottled Gas—Butane—Propane

PHILLIPS PETROLEUM COMPANY

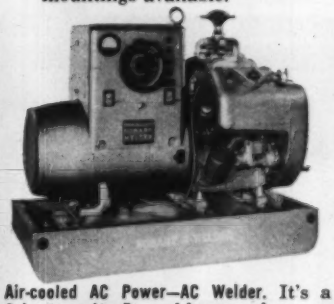
Sales Department · Bartlesville, Oklahoma

Offices located in Amarillo, Tex., Atlanta, Ga., Chicago, Ill., Denver, Colo., Des Moines, Ia., Houston, Tex., Indianapolis, Ind., Kansas City, Mo., Minneapolis, Minn., New York, N. Y., Omaha, Nebr., Raleigh, N. C., Salt Lake City, Utah, St. Louis, Mo., Tampa, Fla., Tulsa, Okla., Wichita, Kans.

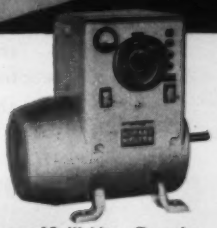
HOBART "ONE OF THE WORLD'S LARGEST BUILDERS OF ARC WELDING EQUIPMENT"



"Husky Boy." This low investment, lightweight 200 amp. air-cooled model is perfect for general shop and outside repair work. Easily mounts on truck or trailer. Portable mountings available.



Air-cooled AC Power—AC Welder. It's a 2-in-1 unit. It welds anywhere or supplies power for operating tools, lights, pumps, paint sprays, etc., independent of power lines.



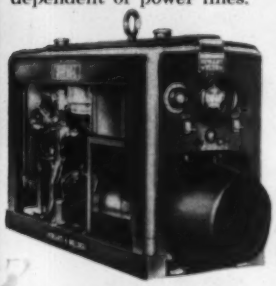
AC Power—AC Welder. Couple this model directly to your gas engine by means of a V-belt or pulley and you can weld or have emergency power when and where you need it on a moment's notice.

Electric Drive. 300 and 400 amp. welders. Ideal for production, maintenance and repair service. Conservative rating lets you do heavy duty welding for limited periods of time.

"Bantam Champ." 250 amp. welder especially designed for light to medium requirements. Popular for all fabrication purposes in the 200 to 250 amp. class.

Transformer Welders. 180 to 500 amp. models for shops that have only single phase power. Exceptional high efficiency and low cost maintenance.

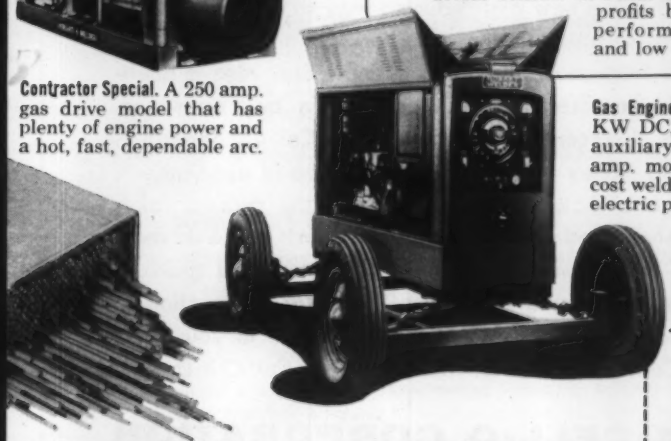
DC Rectifier. 300 amp. Has three delta connected transformer... magnetic line switch... overload protection, plus remote control.



Contractor Special. A 250 amp. gas drive model that has plenty of engine power and a hot, fast, dependable arc.

IT PAYS to COMPARE with HOBART for greater welder value!

The best proof of Hobart's superior advantages and values is comparison with other welders. Try a Hobart—you'll see why you get more actual benefits in dollar savings and increased profits because of its higher performance, faster welding and low cost operation.



Gas Engine Welders with 1 or 3 KW DC, or 6 or 12 KW AC auxiliary power. 200 to 600 amp. models for speedy, low cost welding in the field where electric power is not available.

Generator Only. 200 or 300 amp. with 1 KW 110 volt DC power outlet for "Building Your Own." Just couple it direct or V-belt it to a good gasoline engine.

You can't beat HOBART electrodes

A simple comparison will prove Hobart's superior, top quality welding—in every application. You'll be surprised at the real difference in Welding Electrodes. Get the extra speed that means lower production costs—Try Hobart.

HOBART BROTHERS COMPANY
Box ST-26, TROY, OHIO • PHONE 21223

HOBART BROTHERS CO., BOX ST-26, TROY, OHIO, PHONE 21223
Please send me complete information on the following:

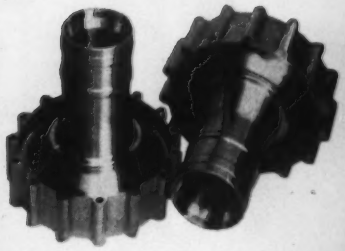
☐ "Husky Boy" ☐ AC Power—AC Welder ☐ "Build Your Own"
☐ Contractor Special ☐ Electric Drive ☐ "Bantam Champ
☐ Transformer Welders ☐ DC Rectifier ☐ Gas Engine Welders
☐ Generator Only

NAME_____ POSITION_____

FIRM_____

ADDRESS_____

CITY_____ STATE_____



There's a first-cost advantage when your Bor-Dril operation can be done on a Standard Ex-Cell-O Machine. This Style 112-D Precision Boring Machine is Bor-Drilling 14 holes from the solid on the part shown above.

Short Cut in Long Hole Drilling

EX-CELL-O'S BOR-DRIL METHOD

Bor-Dril is a new cost-reducing way to drive gun drills. It makes possible high production with accuracy on long holes from solid, maintaining finish size. Also it finish-machines cored holes in castings in one operation. Since its recent introduction by Ex-Cell-O, Bor-Dril is saving money on many newly developed applications. Range of hole sizes is large, and the process takes widely varied sizes and shapes of parts made of steel, cast-iron, bronze, aluminum, magnesium and titanium. For more information on Bor-Dril, or for a quotation on a machine equipped for this work, call in your local Ex-Cell-O Representative or contact Ex-Cell-O in Detroit.

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • GRINDING SPINDLES
CUTTING TOOLS • RAILROAD PINS AND BUSINIGS • DRILL JIG BUSHINGS
AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

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STEEL
The Metalworking Weekly

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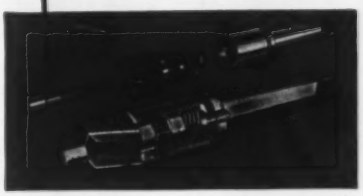
Continental
Counterbore Sets
Save Your Time—
Save Your Tools

A Twist of the Wrist engages or releases the cutters. Double lugs on cutter engage double abutments in holder. Double aligning bearings for rigidity.

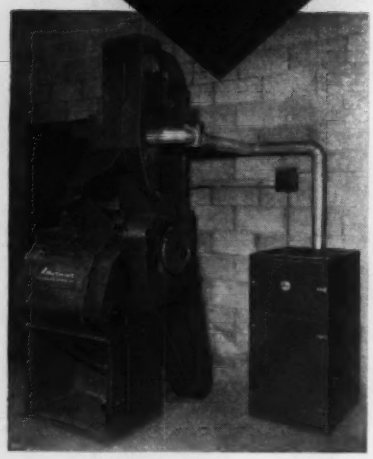


Phantom view shows the strong, rigid drive for quick interchangeability of tools.

CONTINENTAL has three STANDARD COUNTERBORE SETS for your selection. They are toolroom favorites. WRITE FOR CATALOG and prices.

CTW

how to trap dust
that damages your machines and hurts company morale



easy-to-move
TORIT DUST COLLECTORS
trap dust at its source!

Untrapped dust costs you money, "secretly" forces precision machines out of line, limits production. Torit dust collectors are unitized for custom installation—save more money, usually more efficient than central (built-into-the-building) system. Torit unit operates only when machine or combination of machines it protects are in use. Filtered air may be returned to room to save heat. Many models and sizes, all self-contained, easy to move. Write today to... DEPT. 506.

TORIT MANUFACTURING COMPANY

Sweet's

311 Walnut Street
St. Paul 2, Minn.

behind the scenes

Vive le Correspondent

If you will adjust your bifocals and look at page 16, under "Editorial Correspondents," and directly east of the words "Paris, France," you will see, set in 5½-point Ideal type (caps and small caps), the name: "LEON JAUDOIN-PROM." That's the man who is just beginning his thirtieth year as STEEL's correspondent in France. Leon is an ingenieur civil des mines, you comprehend, and also is French representative of the Blaw-Knox Co.

There's a wonderful story that must remain untold about M. Jaudoin-Prom's wartime correspondence. He had to circumvent the German government, the Vichy government, Hitler's Wehrmacht, spies, saboteurs and assorted Hunophiles to get his reports through to STEEL.

Undercover Stuff

"Now that I think about it," mused Editor Walt Campbell from behind a cloud of cigar smoke, "I don't know *how* he got through to us during the war. Somehow he sent his reports in French to Blaw-Knox, and somebody there translated them and sent them on to us. We didn't want to be too nosey for fear he might be tripped up by the Gestapo."

"That's right," said Editor-in-Chief Irwin Such. "You know, I had lunch with Madame and Monsieur Jaudoin-Prom at their apartment on Boulevard Lannes. They had a rough time during the war. Parisians had ration books but could obtain little in exchange for the stamps. And, of course, they were constantly under suspicion.

"The Jaudoin-Prom's have a beautiful apartment overlooking the Bois, and we had an enjoyable visit. I received a Christmas card from monsieur et madame expressing best wishes for a Joyous Noel and a Happy New Year and a note reminiscing about his long association with STEEL."

A letter of commendation already has been sent to Monsieur Jaudoin-Prom—and if this page happens to flutter across the ocean and is brought to his attention, may he attend its message and accept salutations distinctive from STEEL, The Penton Publishing Co. and vieux Shrdlu.

Sound Off!

When the Industrial Heating Equipment Association gathered at the La Salle hotel in Chicago, Monday evening, Jan. 23, most of the members and guests were pleasantly astonished when the Lindberg Engineering Co. chorus put on a musical program that really rocked 'em. The only ones who weren't astonished were those who knew about Lindberg's vice president, Carey H. Stevenson, and the company chorus he backed and developed. During the week, members of the Lindberg chorus help build and sell Lindberg heat treating furnaces, but in their free time, under the direction of Mark Hallett, they give out with things like "The Happy Wanderer," "The Lost Chord" and "Dear Old Donegal" in a manner most professional.

The closing number was a "Showboat" medley, and the spirited rendition probably made more friends for Lindberg Engineering than the efforts of a platoon of public relations men wearing brimless hats and charcoal gray suits.

Does your organization sponsor similar extracurricular cultural activities? If so, tell us about them.

Rhapsody On Pollution

Associate Editor H. Van Yorx Caldwell encountered a bit of fancy description in a Purdue engineering bulletin on industrial waste. Van was researching his article on water (page 136) and read: ". . . the return sludge as it flowed in the sunlight was beautiful to behold. It was deep brown in color and granular in appearance. It teemed with microscopic life, and settled beautifully. The reaction of the plant personnel was: 'This is it!' "

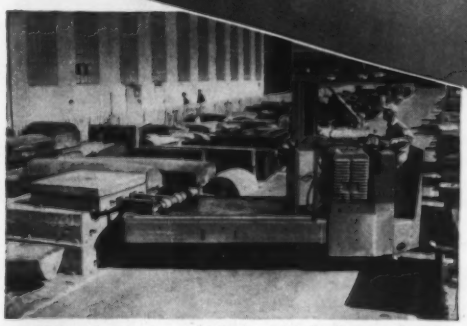
We hate to say it, but a man has to be really lost in his subject to grow that enthusiastic over sewage.

Shrdlu

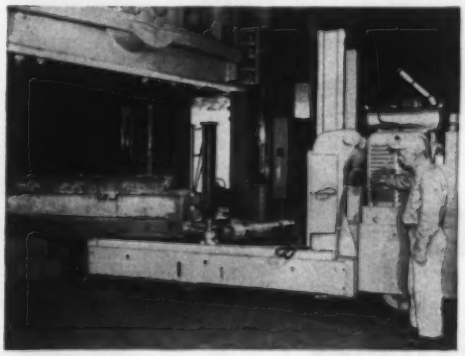
(Metalworking Outlook—Page 69)

FASTER, MORE FLEXIBLE
POSITIONING WITH **NEW**

ELPAR
DIE HANDLER



Note the narrow aisle in which the truck is operating. All wheel power steering makes maneuvering fast and easy.



Long, narrow die is turned 90° as it is pushed quickly off the truck onto the press bed. External sheaves or snatch blocks are not needed.

These are a few of the important features of the E-12 series die handlers that reduce press down time during die changing.

- Entirely new operating principle for close, positive contact with die. Eliminates time wasted rigging cables.
- Hydraulic controls permit "inching" action for accurate die positioning.
- Die can be turned as it goes into press.
- Clear operator vision between uprights allows faster, safer maneuvering.
- Hydraulic power steer and short turning radius permit maneuvering in close quarters.
- Design permits pushing die beyond end of platform into press.
- Capacities from 10,000 to 80,000 pounds.

WRITE FOR THE E-12 SERIES ENGINEERING BULLETIN

ELPAR
INDUSTRIAL TRUCKS

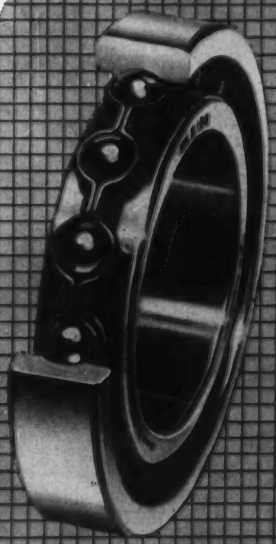
THE ELWELL-PARKER ELECTRIC COMPANY
4101 St. Clair Avenue • Cleveland 3, Ohio

down on the farm-

Rocks and bumps—exposure to all kinds of weather—they're part of the everyday job of International tractors and earth-moving equipment—and part of the everyday jobs of Federal Ball Bearings to keep them rolling.

INTERNATIONAL HARVESTER

so much of industry *turns* on FEDERAL ball bearings



Tractors and escalators—cars and planes—if people and things are moving—Federal Ball Bearings keep them moving. In your home, office or factory, you'd probably find some of the hundreds of bearing types that this 50-year-old company is now making in over 12,000 sizes.

When Federal Ball Bearings are a part of so many things you *use*, shouldn't they be a part of the things you *make?*

THE FEDERAL BEARINGS CO., INC. • POUGHKEEPSIE, N. Y.

or up an escalator-

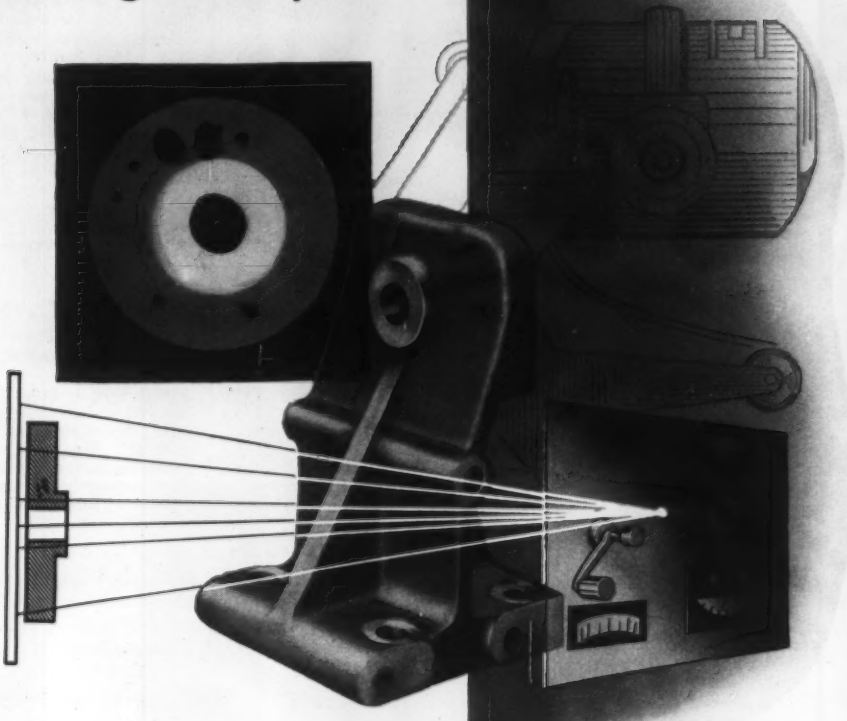
Getting thousands of workers in and out of subways, bus terminals and skyscrapers puts repeated, concentrated loads on Otis escalators and elevators. Federal Ball Bearings help take the ups and downs in quiet stride.

Have a look at the 175 pages of ball bearing information in Federal's catalog. Just drop us a line and we'll send you your copy.

Federal BALL BEARINGS

One of America's Largest Ball Bearing Manufacturers

new atomic camera at CENTRAL FOUNDRY DIVISION aids engineering developments and improves casting techniques



An atomic camera that photographs castings is now solving casting problems at Central Foundry Division. This modern radiation camera utilizes gamma rays from Cobalt-60 to penetrate the casting and record its structure on film. It is a far more accurate method of testing a casting's soundness than the usual practice of breaking or sawing the casting for examination. Because castings will be photographed before a design goes into full production, customers will be assured of good metallurgical structure in their finished part. Thus, to its already excellent facilities for producing high quality castings, Central Foundry Division has added science's most advanced contribution: gamma ray photography.

The atomic camera at Central Foundry Division is one of the first such installations in the world. Its power to photograph resides in a pill-sized pellet of radioactive cobalt—Cobalt-60—surrounded by protective plates of lead. A casting is placed in front of the camera's lead "shutter," and a photographic film fastened behind the casting . . . just as in medical X-Rays. When the camera is opened (by remote control from a radiation-proof room), the Cobalt-60 hurls a stream of gamma rays which pass through the casting onto the film. The photo, or radiograph, is removed as soon as it is safe and read for casting defects. Naturally, with modern techniques as advanced as they are, casting flaws are the exception rather than the rule, but even infinitesimal flaws which before would have escaped notice are now detected by the radiograph. Duly interpreted by experienced engineers, these flaws will indicate what needs to be changed in the design or manufacturing process to achieve better castings. It is expected that, in addition to the improvement of specific castings, a knowledge never before possible of metal flow and cooling will be acquired, with application to gate, riser, and cavity design, and to pouring practice. The development of sound and practical castings for new engineering designs will be speeded by the use of this tool.

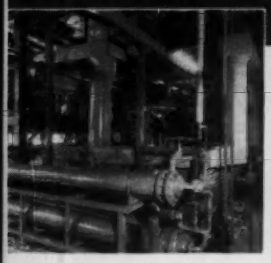
The pioneering of radiograph technology to produce better castings is typical of the many ways in which Central Foundry Division works to aid its customers. The new shell mold process here at Central Foundry results in closer-tolerance castings. The development of ArmaSteel (a pearlitic malleable iron) provides products with physical characteristics similar to plain carbon steel forgings. Central Foundry's engineering staff, metallurgical laboratory and modern production-line facilities are equipped to produce castings of consistently high quality from grey iron, malleable iron, or ArmaSteel, from either conventional or shell molds. Write for descriptive literature or a consultation with our engineers, without obligation.

60

CENTRAL FOUNDRY DIVISION

GENERAL MOTORS CORPORATION • SAGINAW, MICHIGAN • DEPT. 20

PLATING 400,000 POUNDS A DAY WITH THIS **UDYLITE** MACHINE . . .



End view showing exhaust system and heat exchangers.

Unloading station of Udylite Automatic Barrel Machine.

Drum type dryer used for drying bright zinc plated work.

Harding Manufacturing Company are bright zinc plating 20,000 pounds of small parts per hour with their Udylite Full Automatic Barrel Plater and are running it 20 hours a day.

Only four men are used in operating this Udylite machine. One man loads the feeder hopper. One man loads the cylinders. One man unloads the cylinders and one man unloads the dryer and dichromating operation—*5,000 pounds of plating per man hour.*

And with this tremendous production is all the desired versatility. The machine is so designed with electrical controls that the plating time and thickness of plating in each cylinder load can differ from other loads going through the machine cycle at the same time. The plating time for each load is predetermined by the operator at the time the cylinder is loaded.

This is another example of Udylite experience in production plating. If you have a plating problem—large or small—it will pay you to consult Udylite.

THE Udylite CORPORATION
DETROIT 11, MICHIGAN

WORLD'S LARGEST PLATING SUPPLIER

LETTERS TO THE EDITORS

Lauds Heat Treating Series

I have read your article, "Heat Treating Steel Castings" (Jan. 23, page 84), and feel that it is an excellent description of the methods that should be employed in steel foundries today.

I would appreciate eight copies for circulation among our field inspectors that are connected with foundry work.

In conclusion, I wish to say that I feel your Modern Heat Treating series is one of the most instructive that has ever appeared in any trade journal. Good luck in your effort to give the best in reading to your subscribers.

Fred M. Huennekens
Resident Inspector of Naval Material
Falk Corp.
Milwaukee

Salesman's Quota of Sales

I think your article, "Fair Pay for Salesmen" (Jan. 9, page 27) is excellent. It covers the field in an interesting way and makes some points that are not too commonly understood.

Now you might go a step farther. If you are going to base a salesman's income on the sales from his territory, you first have to decide what is a reasonable quota of sales from that territory.

Many companies do this every year, and it is at best a difficult assignment. It is unfortunate that this process has acquired the name of "market research" which frightens some people away.

Tell Berna
Executive Vice President
National Machine Tool Builders' Association
Cleveland

"Depression-Proofing"

I re-read with interest this morning the article, "Expansioneering" (Jan. 2, page 101). I agree in principle with everything said (with one exception) and congratulate your publication on its statesmanlike approach to our future growth.

The exception (and perhaps it is only one of terminology) makes me shudder slightly. Under the subhead, "$64 Billion Question," you say: "There are good reasons to believe that we are making good progress toward depression-proofing the economy."

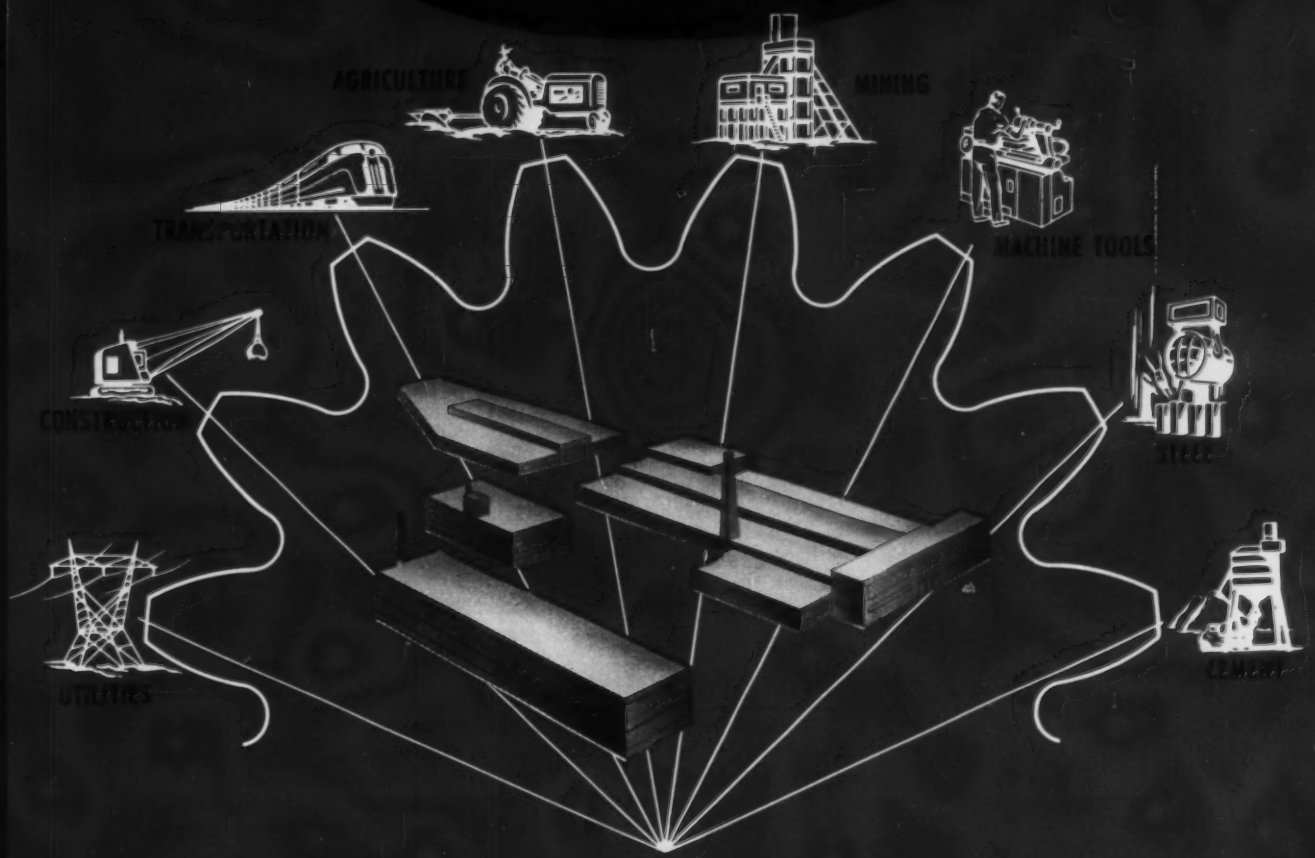
In my book, the fundamental economic laws which I attempted to learn in college still hold good. There can be no real "depression-proofing" in any country's economy, let alone that of the individual business.

I know this phrase has appeared in public print on innumerable oc-

(Please turn to page 12)

ILLINOIS GEARS...

Long the Choice of American Industry



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For complete application service, call your Consulting Engineer or your nearest Sturtevant Division Sales Engineer or write Westinghouse Electric Corporation, Sturtevant Division, Dept. 4 B, Hyde Park, Boston 36, Mass.

WESTINGHOUSE AIR HANDLING

YOU CAN BE SURE...IF IT'S Westinghouse

J-80456

LETTERS

(Concluded from page 10)

casions during the past year or so and has been used by some of our politicians in their various statements and speeches.

Approximately a month ago, I listened to Martin of the Federal Reserve give a semi-off-the-record talk to a large group of businessmen. I don't know how you feel about Martin, but I believe him an eminently sound financial man, plus being a good economist.

At one point in his talk, he referred to this "depression-proofing" phrase which has been bandied around of late, then went on to say that, in his opinion, anyone who believes that our economy is becoming "depression-proof" has "bats in the belfry"... that the laws of supply and demand, credit, inflation and deflation still were in good working order and that the latter two, if not carefully watched, could easily dominate our economy.

He went on to make one further telling remark that he was afraid of inflation because it could lead to deflation.

"Depression-proofing" is a memorable and telling phrase, and I am surprised to see it bandied around in such a solid publication as yours. Tish, tish.

Bayard Allis
Barium Steel Corp.
New York

Preventing "Tired" Metal

The article, "What You Can Do About Metal Fatigue" (Jan. 16, page 68), contains technical information that would prove helpful to us in our work. We would like three copies.

C. H. Bommerscheim
Head
Technical Service
National Water Lift Co.
Kalamazoo, Mich.

This article is interesting and informative. Please provide me with three reprints.

Lyle Wallis
Senior Materials Engineer
Glenn L. Martin Co.
Baltimore

Executives To Get Survey

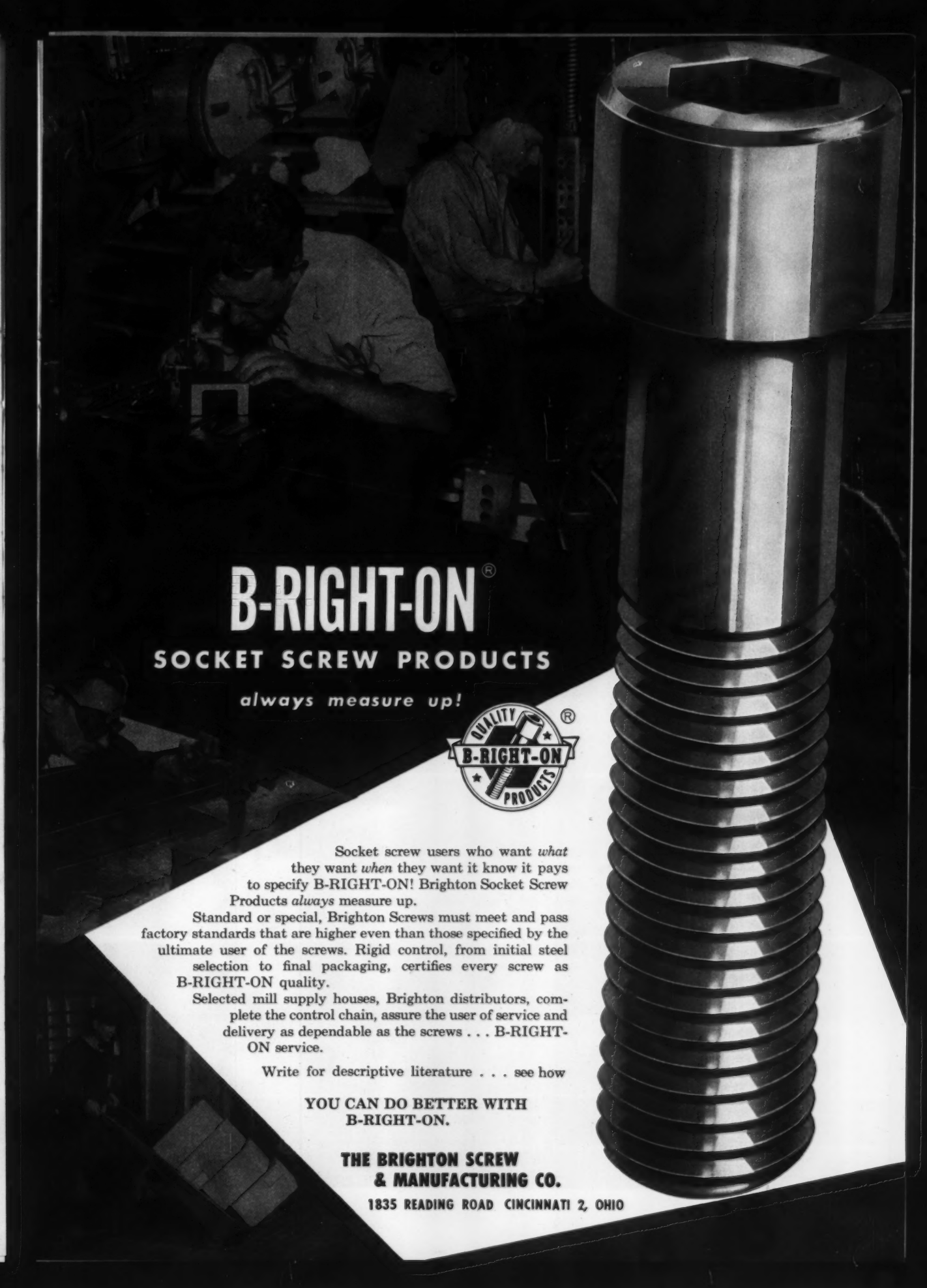
I recently received a copy of STEEL's survey, "What Metalworking Management Expects in 1956" (Jan. 2, page 105). I found it interesting and informative.

I would like to obtain 125 copies of the survey to distribute among our top executives throughout the corporation.

T. Singelis
Director of Advertising
U. S. Industries Inc.
Chicago

Please send 50 copies of this report. We would like to send it to our district sales offices.

James M. Quick
Advertising Manager
Eclipse Fuel Engineering Co.
Rockford, Ill.



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always measure up!

QUALITY B-RIGHT-ON PRODUCTS ®

Socket screw users who want *what* they want *when* they want it know it pays to specify B-RIGHT-ON! Brighton Socket Screw Products *always* measure up.

Standard or special, Brighton Screws must meet and pass factory standards that are higher even than those specified by the ultimate user of the screws. Rigid control, from initial steel selection to final packaging, certifies every screw as B-RIGHT-ON quality.

Selected mill supply houses, Brighton distributors, complete the control chain, assure the user of service and delivery as dependable as the screws . . . B-RIGHT-ON service.

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OF CARBIDE TOOLS
DEALERS HAIL
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Read off the headlines Morse has made in the last few years! Hi-Helix End Mills . . . the Ambore Drill . . . Morse Electrolizing . . . new teletype-telegraph network to speed up service . . . then the sensational "Vectormatic" Ground Taps . . .

And now MORSE ADDS CARBIDE TOOLS . . . *to give you the most complete line of cutting tools ever offered under one name.*

This means that your Morse-Franchised Distributor is in a position to recommend the best and most economical cutting tool for every job in your plant . . . be it carbon, high speed or carbide. He's backed by Morse's years of experience in carbide tooling . . . and he's the one man who has the most in cutting tools. *Call him in today.*

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NEW BEDFORD, MASSACHUSETTS
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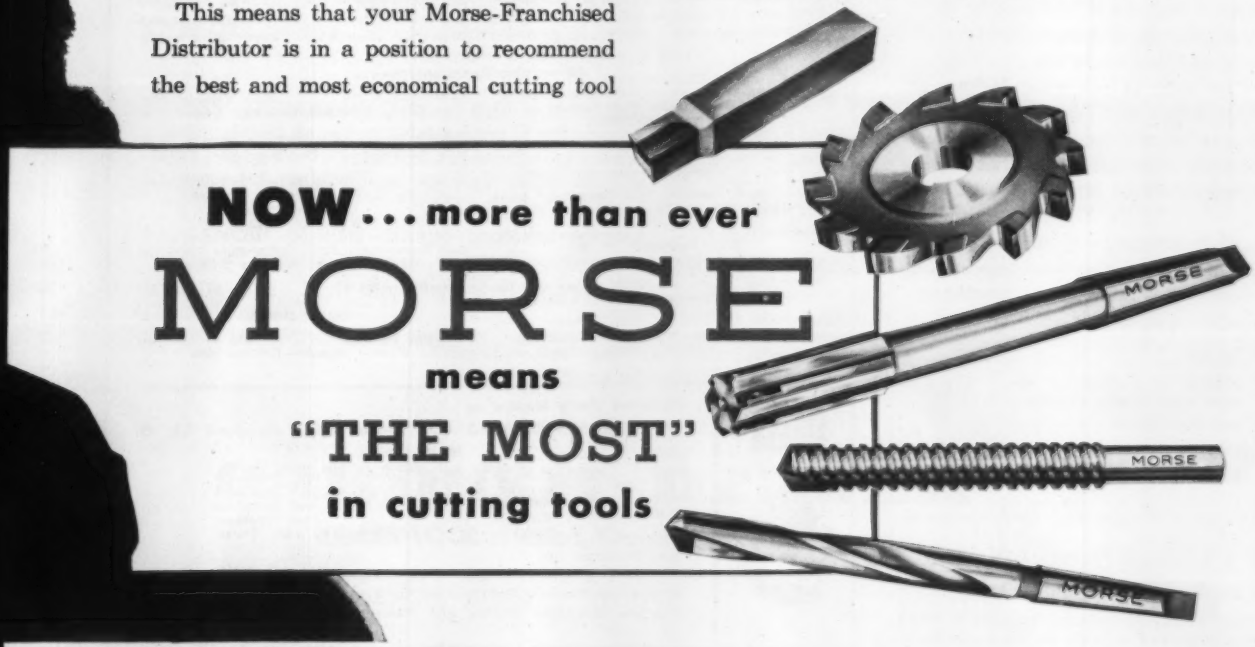

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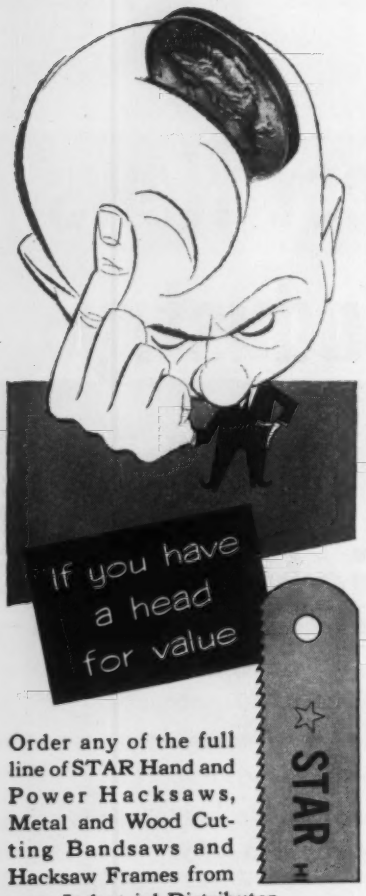
"THE MOST"

in cutting tools



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Industry prefers STAR quality, prefers the blades made of carefully heat-treated, top-quality steel, fabricated on specially designed equipment—because STAR consistently delivers fast, economical metal cutting and long blade life.

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New Keller Portable Air Drills!

with 10 outstanding features that production men know will increase output . . . reduce costs.

- **MORE POWER**—Newly designed side air intake and exhaust porting provide for greatly increased power. Capacities up to ¼"—5/16".
- **LIGHTER WEIGHT**—Advanced engineering enables weight reduction along with greater power.
- **GREATER RANGE**—Provides speed-torque range from 600 to 17,000 rpm to meet practically all drilling requirements.
- **QUIET OPERATION**—Quietest drill with adjustable exhaust deflectors. Noise level is reduced by controlling the exhaust without sacrificing power. Operator fatigue caused by high noise level is minimized.
- **BALANCED DESIGN**—Shape provides utmost operator comfort and ease of handling.
- **SMALL SIZE**—Body diameter only 1½" with ¾" spindle offset.
- **SUSPENSION BAIL**—Standard equipment.
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- **ONE-SHOT LUBRICATION**—With flush type fitting.
- **LOW AIR CONSUMPTION**—Side air intake and large exhaust parts provide low air consumption and more efficient operation.

Write for Bulletin 11A giving complete information about these all-new KELLER Air Drills.

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KELLER TOOL division, Grand Haven, Michigan

THE QUALITY LEADER IN COMPRESSORS, PUMPS, ROCK DRILLS AND AIR TOOLS FOR CONSTRUCTION, MINING, PETROLEUM AND GENERAL INDUSTRY

SOME OF THE REASONS YOU GET BETTER SERVICE WITH KAISER PERICLASE-CHROME BRICK:

1. Low permanent growth from iron-oxide attack minimizes end wall buckling and spalling.
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3. No liquid phase in forming its ceramic bond. Volume stability.
4. High MgO content in end wall brick provides greater resistance to carryover erosion and iron oxide attack.
5. Lowest porosity minimizes alteration by resisting penetration of gases and impurities.

CHEMICALS
KAISER
REFRACTORIES

Expansion tests show why you get SUPERIOR END WALL SERVICE with Kaiser Periclase-Chrome Brick

ONE REASON why Kaiser Periclase-Chrome Brick assures better end wall service for many leading steel producers is shown by this laboratory test of the effect of steel plates on permanent growth.

In this test, pre-fired 9x4½x3" bricks of two types were compared: brick having a chrome-magnesite ratio of approximately 75 to 25, and Kaiser Periclase-Chrome Brick.

Both types of brick were laid up as headers, forming the side walls of a tangentially fired pot furnace. 16-gauge steel plates were applied to the four sides of the bricks. The bricks were set loosely, with only 4 courses of brick overlaying the test pieces.

The effects produced in the laboratory were the result *solely of the heating and iron oxide reaction*. Heating and atmosphere conditions were identical on each type of brick. The furnace was heated with gas to 3100°F. ± 25°, and held at this temperature for 16 hours. Heating and cooling was at the rate of 75°F. per hour to minimize thermal spalling effects.

Results of the test

After cooling, the bricks were separated and photographed. (See picture.) Note strings stretched from top corners of new brick on ends of each row. Comparative growth on hot faces of brick shows above strings. The upper row of brick is the chrome-magnesite type. The maximum linear cold expansion of these bricks was 1" or 11%, with an average of 9%.

The lower row of bricks are Kaiser Periclase-Chrome. The maximum linear cold expansion of the Kaiser brick was only 3/16" or 2.1%, with an average of only 1.4%.

These values are in addition to the reversible thermal expansion, in each case.

Also, note in the picture the cracking of the chrome-magnesite type brick caused by the relatively great iron-oxide swelling. The Kaiser Periclase-Chrome Brick is free from such cracks.

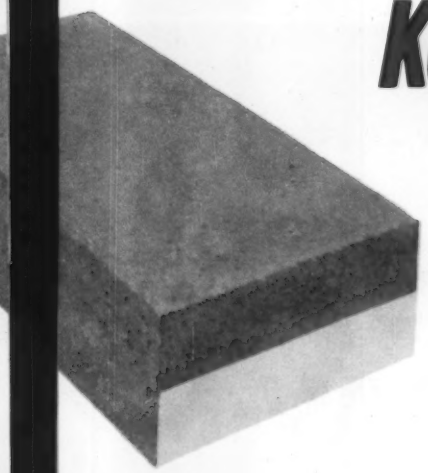
The superiority of Kaiser Periclase-Chrome Brick

This test indicates only one of many reasons why Kaiser Periclase-Chrome Brick gives hearth operators better end wall service.

The special composition of Kaiser Periclase-Chrome Brick assures less spalling, less swelling, greater resistance to abrasion and alteration by oxide and slag. This superior brick can greatly increase end wall life or greatly reduce wall thickness to cut costs, when end wall service is balanced.

Call or write any of the sales offices listed below for immediate attention to your end wall particular problems.

Call or write Kaiser Chemicals Division, *Kaiser Aluminum & Chemical Sales, Inc. Regional Sales Offices: 1924 Broadway*, OAKLAND *12, Calif. . . . 3 Gateway Center*, PITTSBURGH, *Pa. . . . 518 Calumet Building, 5231 Hohman Ave., Hammond, Indiana* (CHICAGO).



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Kaiser PERICLASE Brick for the Steel Industry:

- Periclase Brick (D-S)
- Periclase Chrome Brick
- Chrome Periclase Brick

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Manufacturing top-quality generators is only one of many results of over eighty years of constant electroplating development—a continuing policy summed up in H-VW-M Platemanship...your working guarantee of the best that industry has to offer—not only in plating—current generators—but in every phase of plating and polishing.

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small-unit packaging simplifies use and handling of

STAINLESS STEEL SAFETY LOCK WIRE

The availability of stainless steel safety lock wire on 1, 5 and 10-pound disposable spools is good news to manufacturers and service organizations in the aircraft, automotive and machinery industries—or wherever safety lock wire is required.

These small-unit spools—now offered for the first time by National-Standard—are expected to simplify many manufacturing and servicing operations, ranging from extensive use of the handy 1-pound hip pocket or toolbox spools in non-localized work, to bench or production uses for the larger spools.

In addition to spools of the 3 capacities, National-Standard offers the lock wire in a complete range of sizes, from 0.020 to 0.067-inch and in five different government specifications: QQ-W-423; AN-W-23; AN-W-24; MIL-W-6713 and AMS-5685-C.

Spools of all three sizes can be mounted on "let-off" spindles and are clearly labeled as to type and size of wire. The 1-pound spools are plastic, the larger spools metal.

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NILES, MICHIGAN

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Tire Wire, Stainless, Fabricated Braids and Tape

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Flat, High Carbon, Cold Rolled Spring Steel

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Special Machinery for Metal Decorating

WORCESTER WIRE WORKS DIVISION • WORCESTER, MASS.
Round and Shaped Steel Wire, Small Sizes

...this

modern CINCINNATI PRESS BRAKE...

gets the orders

at MARION MACHINE, FOUNDRY & SUPPLY CO.
Marion, Indiana

This Cincinnati Press Brake immediately produced orders in a highly competitive jobbing market.

A $25,000 job, which previously would have been lost, was profitably handled. A 3" channel with 2¾" flanges was formed in six gauge material.

Investigate these modern design features for low cost production.

- Centerline loading.
- Rigid, All-Steel Construction
- Deep beds and rams
- Interlocked construction
- Large, high strength radii—free of weld
- Ram elevation—complete with micrometer indicators
- Tilting ram adjustment

Write for Cincinnati Press Brake Catalog B-4.

Photos courtesy the Marion Machine, Foundry & Supply Company, Marion, Indiana.

THE CINCINNATI SHAPER CO.

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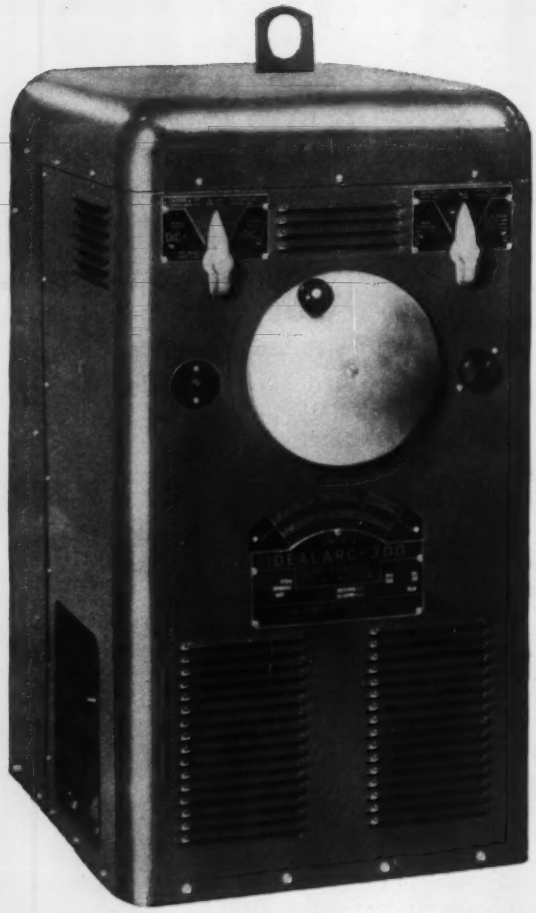
CINCINNATI

8 reasons why production welding should be done with LINCOLN

IDEALARC



1. **Choice of AC or DC** welding current . . . whichever is best for your job. The ideal welder for production line operations.

2. **Dual control gives soft arc and forceful, non-sticking arc** . . . Idealarc gives you both, in AC and DC.

3. **Easy Striking** . . . Lincoln Arc Booster gives easy striking for both AC and DC to assure positive arc starting.

4. **Steady arc** that is easiest to hold with any electrode in any position, AC and DC.

5. **Dependable operation** under the heaviest loads... with complete overload protection against burnout.

6. **Simplest installation** . . . operates on single phase power.

7. **Available as a straight AC welder** to which DC can be added at any time.

AND THE BEST REASON OF ALL

8. **LOWER COST PER WELD** through faster AC and DC welding with Lincoln's new iron-powder electrodes:

JETWELD 1 for welding flat and horizontal fillets.

JETWELD 2 for welding flat, deep grooves and horizontal fillets.

JETWELD 2HT for welding flat position, deep groove joints and fillets in low-alloy, high tensile steels.

"Improved" **FLEETWELD 47** for fast, smooth, all-position welding.

Hadn't you better check LINCOLN now?

Have Lincoln's factory-trained specialist show you how IDEALARC and these new Lincoln electrodes will give you better production, lower costs. Write for Bulletin 1343.

THE LINCOLN ELECTRIC COMPANY

Dept. 1613, Cleveland 17, Ohio

The World's Largest Manufacturer of Arc Welding Equipment

Want prolonged paint adherence?
Weirzin
ELECTROLYTIC ZINC-COATED SHEET
How to paint, enamel, lacquer or lithograph metal parts is often a perplexing problem. Poor adherence means dissatisfied customers.
Weirzin has a simple solution, proved highly satisfactory, in a tight malleable zinc coating that is *actually part of the steel.* The coat remains intact even under extreme temperature and humidity. What's more, neither punching nor forming nor deep drawing can rupture the even deposit. Thus underfilm corrosion cannot form and, as a result, paint does not crack, chip or flake.
This electrolytic zinc-coated steel—with or without chemical treatment—is available in coils, in cut lengths, in all regular widths and gauges. Find out how easily leading manufacturers satisfy their customers with this exceptional product. Phone or write now.
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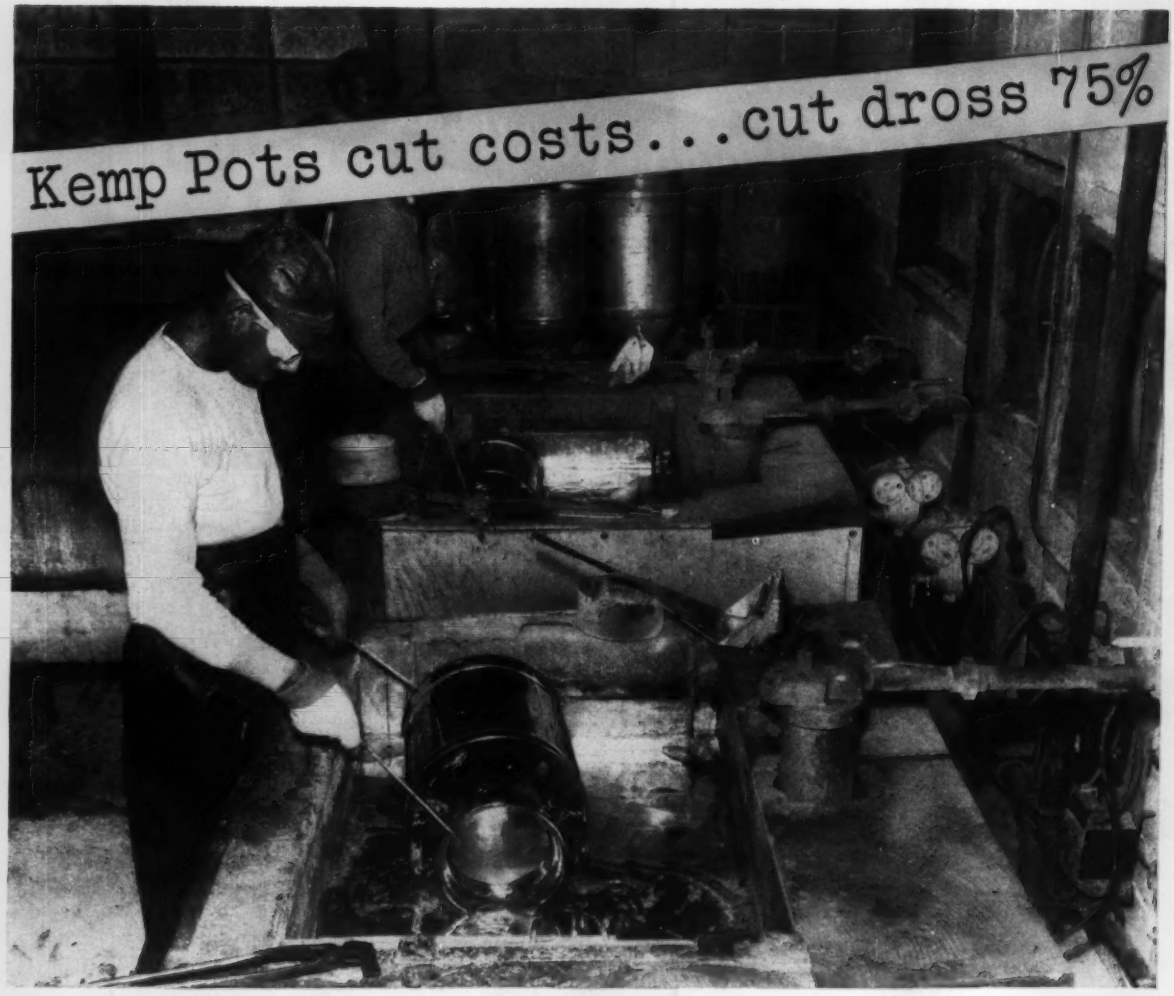

Springfield Can Co. reports: *Improved retinning quality at lower cost with Kemp Melting Pots*

Retinning dairy equipment is the main plant operation at the Springfield (Missouri) Can Co. Milk cans are treated in a retinning room where 2 Kemp Immersion Heating Pots melt block tin and keep it in liquid form for the operation.

Installed in January, 1955, the Kemp Pots have already proved superior to the old, externally heated pots in quality control. They have reduced dross formation 75%. The constant, even heat of Kemp Pots helps produce heavier tin coatings, which give the retinned cans the quality appearance and life of new cans.

Kemp Saves Fuel, Production Time

The Kemp units heat much faster than old-fashioned methods and maintain an even temperature. This means lower fuel costs as well as valuable production time saved. Mr. Jack Simon, Springfield Can Co. owner, sums it up by saying, "The Kemp Melting Pot is the finest produced!"

Kemp Can Help You

You benefit in many ways when you install Kemp Melting Pots: they are not subject to periodic and expensive breakdowns . . . offer greater heating surface, faster heat recovery, lower dross formation, even lower room temperatures—they operate continuously at maximum efficiency with a substantial saving in fuel costs.

Find out how Kemp engineers can provide the most profitable solution to your heating or melting problem. Write for Bulletin IE-10 today.

KEMP OF BALTIMORE

IMMERSION MELTING POTS

CARBURETORS • BURNERS • FIRECHECKS • ATMOSPHERE & INERT GAS GENERATORS • ADSORPTIVE DRYERS SINGEING EQUIPMENT

THE C. M. KEMP MFG. CO.
405 East Oliver Street, Baltimore 2, Maryland

CALENDAR
OF MEETINGS

Feb. 6-8, American Management Association: Marketing conference. Hotel Statler, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

Feb. 9-10, Steel Kitchen Cabinet Manufacturers Association: Spring meeting, Waldorf-Astoria, New York. Association's address: 1008 Engineers Bldg., Cleveland 14, O. Secretary: Arthur J. Tuscany Jr.

Feb. 13-17, American Society of Civil Engineers: Winter meeting, Baker hotel, Dallas. Society's address: 33 W. 39th St., New York, N. Y. Secretary: William N. Wisely.

Feb. 15-17, American Management Association: Personnel conference, Palmer House, Chicago. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: James O. Rice.

Feb. 16-17, Drop Forging Association: Winter industry meeting, Park Sheraton hotel, New York. Association's address: 419 S. Walnut St., Lansing, Mich. Executive vice president: Edgar L. Harden.

Feb. 16-17, Eastern States Blast Furnace & Coke Oven Association: Winter meeting, William Penn hotel, Pittsburgh. Information: B. W. Norton, Shenango Furnace Co., Sharpsville, Pa.

Feb. 19-23, American Institute of Mining & Metallurgical Engineers: Annual meeting, Hotels Statler and New Yorker, New York. Institute's address: 29 W. 39th St., New York 18, N. Y. Secretary: E. O. Kirkendall.

Feb. 20-22, Association of Iron & Steel Engineers: West Coast meeting, Hotel Statler, Los Angeles. Association's address: 1010 Empire Bldg., Pittsburgh 22, Pa. Managing director: T. J. Ess.

Feb. 26-29, American Institute of Chemical Engineers: Winter meeting, Hotel Statler, Los Angeles. Institute's address: 120 E. 41st St., New York 17, N. Y. Secretary: F. J. Van Antwerpen.

Feb. 27-29, American Management Association: Annual electronics conference and exhibit, Hotel Commodore, New York. Association's address: 330 W. 42nd St., New York 36, N. Y. Vice president-secretary: J. O. Rice.

Feb. 27-Mar. 2, American Society for Testing Materials: Committee week, Hotel Statler, Buffalo. Society's address: 1916 Race St., Philadelphia 3, Pa. Executive secretary: Robert J. Painter.

Mar. 5-6, Instrument Society of America, Pittsburgh section: Conference on instrumentation for the iron and steel industry, Hotel Webster Hall and Mellon Institute of Industrial Research. Society's address: 845 Ridge Ave., Pittsburgh 12, Pa. Secretary: Fred Marton.

Mar. 6-8, Society of Automotive Engineers Inc.: National passenger car, body and materials meeting, Hotel Statler, Detroit. Society's address: 29 W. 39th St., New York 18, N. Y. Secretary: John A. C. Warner.

Mar. 11-14, National Association of Waste Material Dealers Inc.: Annual meeting, Waldorf-Astoria, New York. Association's address: 271 Madison Ave., New York 16, N. Y. Managing director: Clinton M. White.

Mar. 12-14, International Acetylene Association: Annual meeting, Hotel Statler, Los Angeles. Association's address: 30 E. 42nd St., New York 17, N. Y. Secretary: H. F. Reinhard.

Mar. 12-15, National Electrical Manufacturers Association: Mid-winter meeting, Edgewater Beach hotel, Chicago. Association's address: 155 E. 44th St., New York 17, N. Y. Managing director: Joseph F. Miller.

Mar. 12-16, National Association of Corrosion Engineers: Annual meeting and exhibit, Hotel Statler, New York. Association's address: 1061 M & M Bldg., Houston 2, Tex. Executive secretary: A. B. Campbell.

Mar. 13-15, Radio-Electronics-Television Manufacturers Association: Spring meeting, Biltmore hotel, New York. Association's address: 777 14th St. N. W., Washington 5, D. C. Secretary: James D. Secrest.

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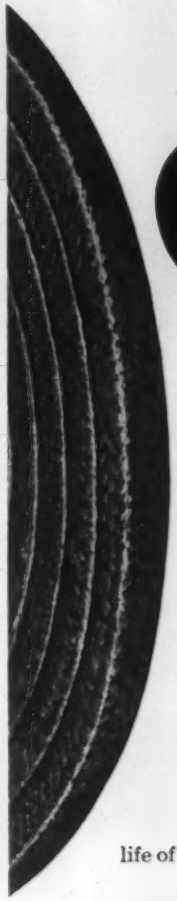

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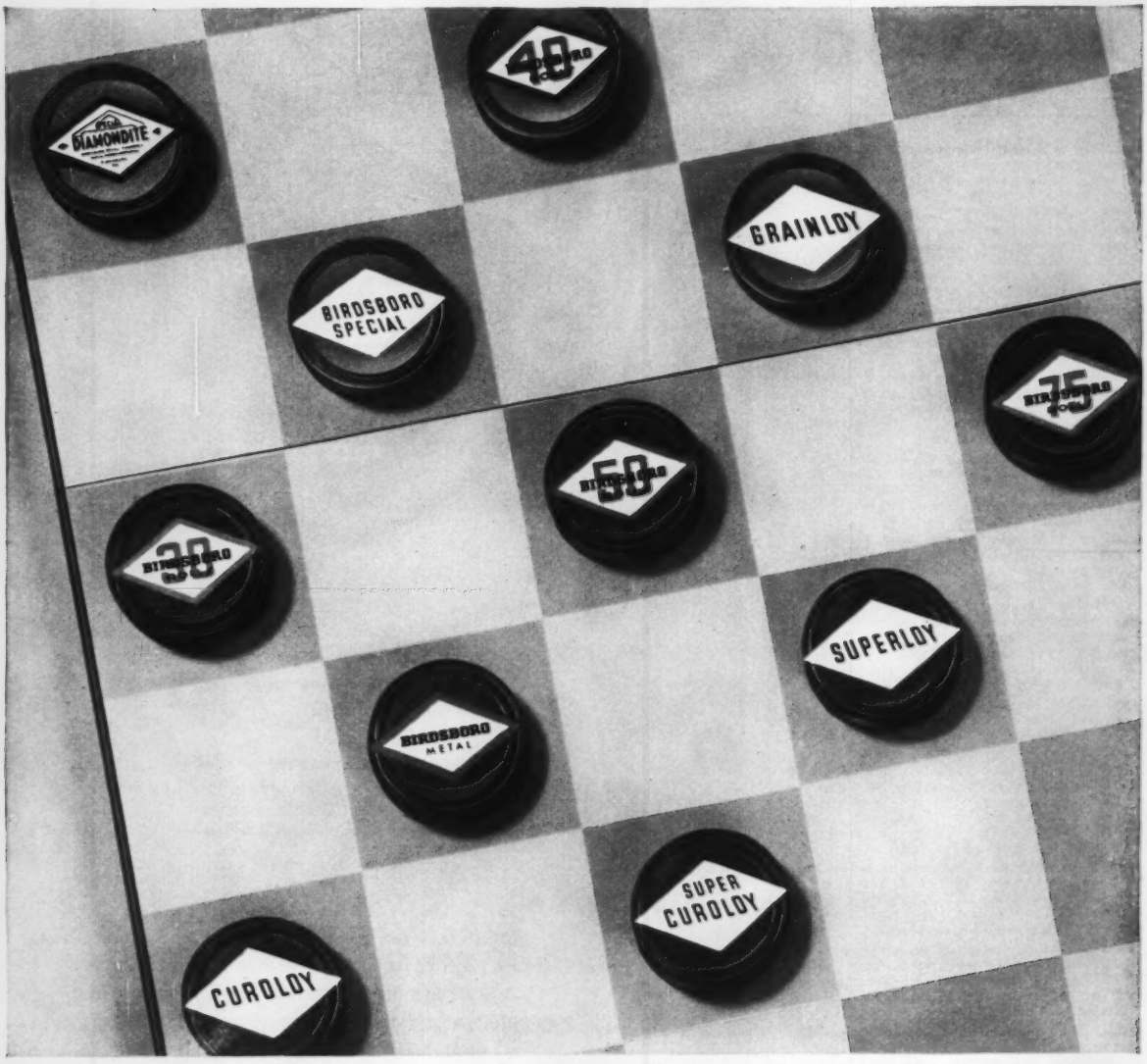

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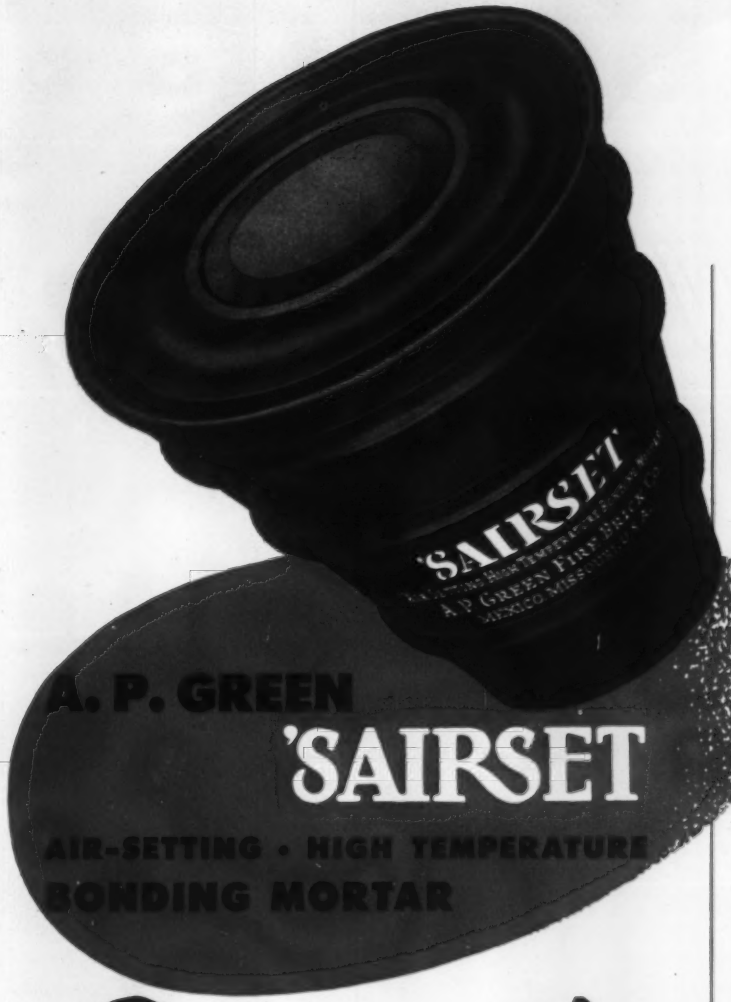

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Hailed as the greatest achievement in modern OBI press design and performance, by over 100,000 spectators who examined this mechanical marvel at the Machine Tool Show, the all-new Niagara Series E, Single Point, Open Back Inclinable Press starts a brand new chapter in press history.

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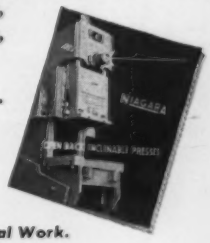

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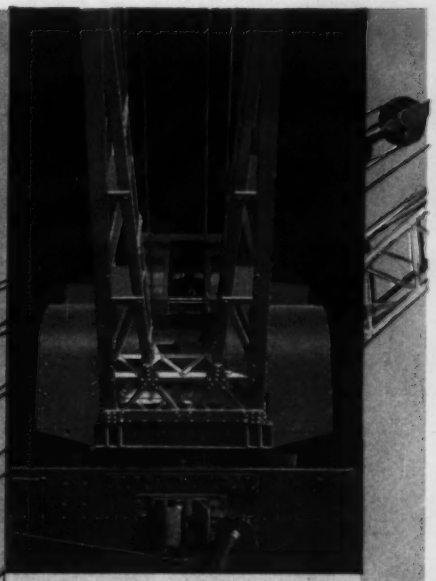
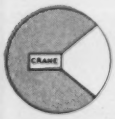


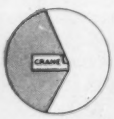
This view from below shows you the great visibility right through the middle of the Clear Vision Boom.

Windows on all sides of the raised Monitor Type Cab of a Brownhoist Locomotive Crane give the operator a full view of the area in which he is working, and the open type Clear Vision Boom lets him look right down at the work itself. This complete 360° visibility—to the sides, to the rear, and forward into the car—allows the operator to work more rapidly, without unnecessary crane swinging, and also increases safety by eliminating blind spots. The patented Monitor Type Cab has a door on each side, and all doors and windows can be opened for ventilation. A soundproof partition separates the operator from the engine and controls are placed within convenient reach of his adjustable seat. These factors assure ease of operation of the Brownhoist Locomotive Crane, and Brownhoist engineering assures maximum performance. Anti-friction bearings are used throughout including machinery side frames. The boom hoist is worm driven for smooth, safe operation. Dynamatic clutches disconnect all upperworks when travelling . . . give sure, positive control. High strength alloy steels bulwark the machine for heavy service. Throughout, Brownhoist Locomotive Cranes are designed and built for high capacity production. For further information write today for Catalog No. 548.

Approximate visibility from ordinary cab.



Approximate visibility from side-operated cab.



360° visibility from I. B. patented Monitor Type Cab.

Your operator can see exactly what he's working with in the car in front of him. Greater safety is the result.

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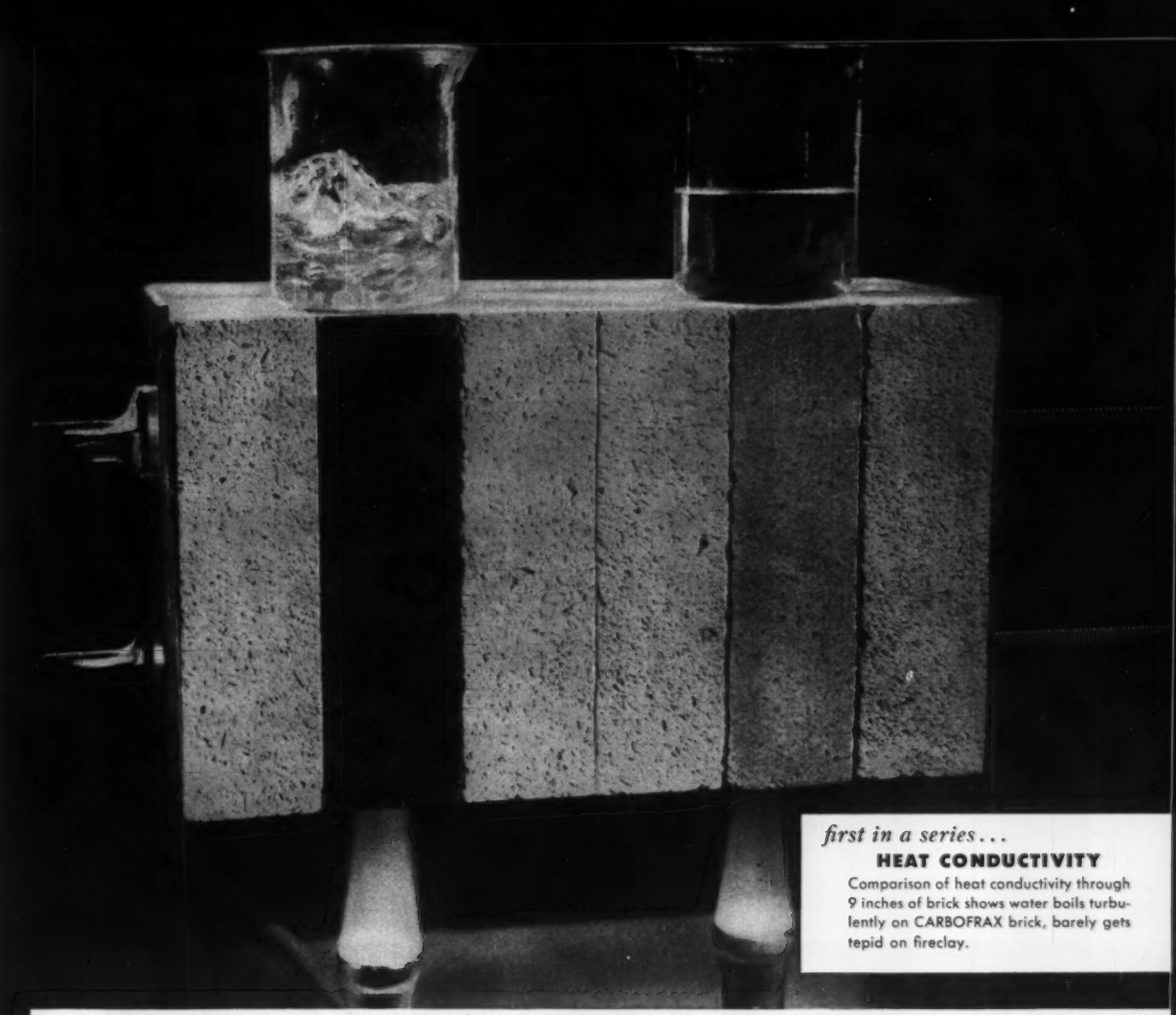

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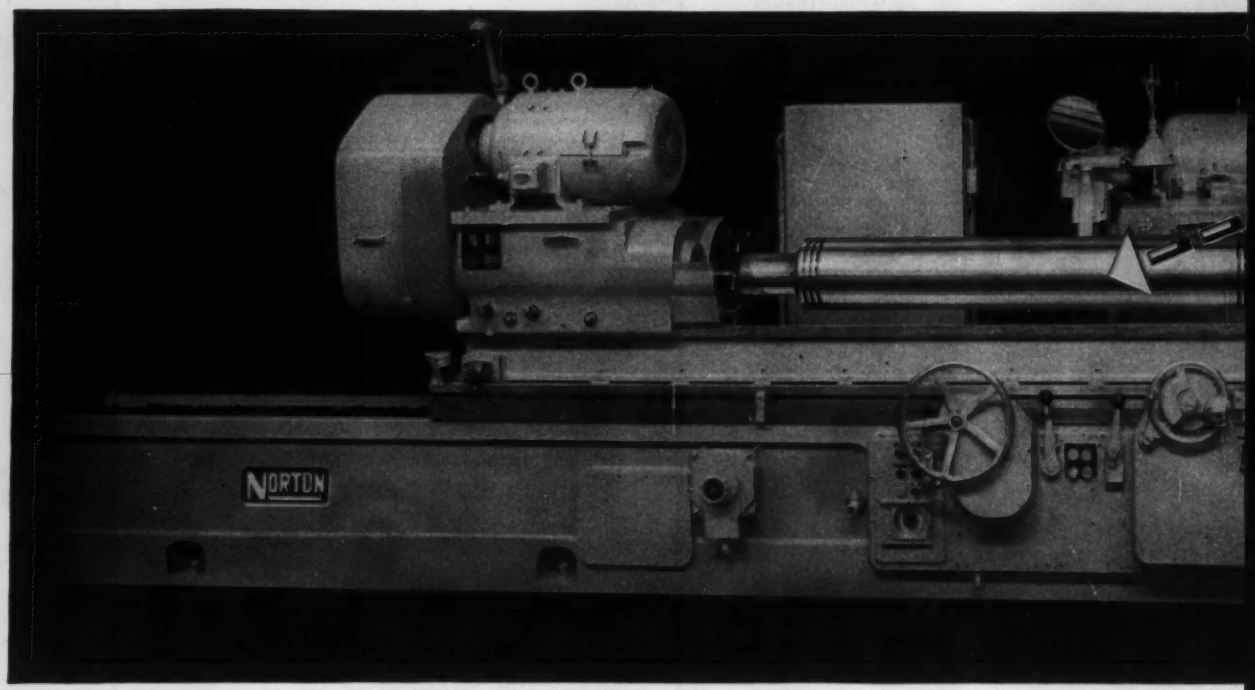

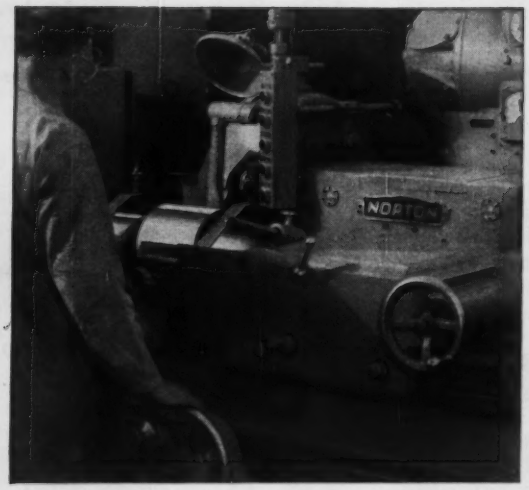

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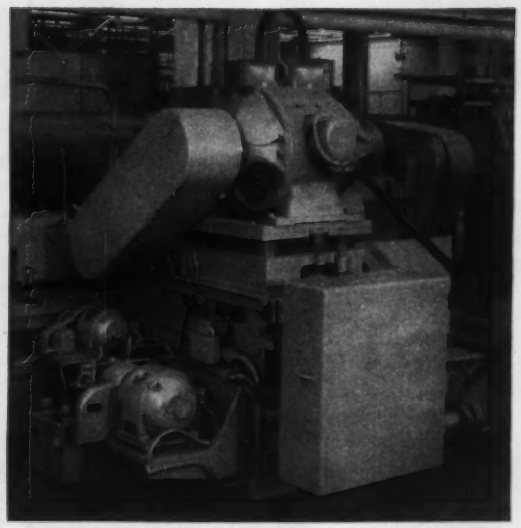

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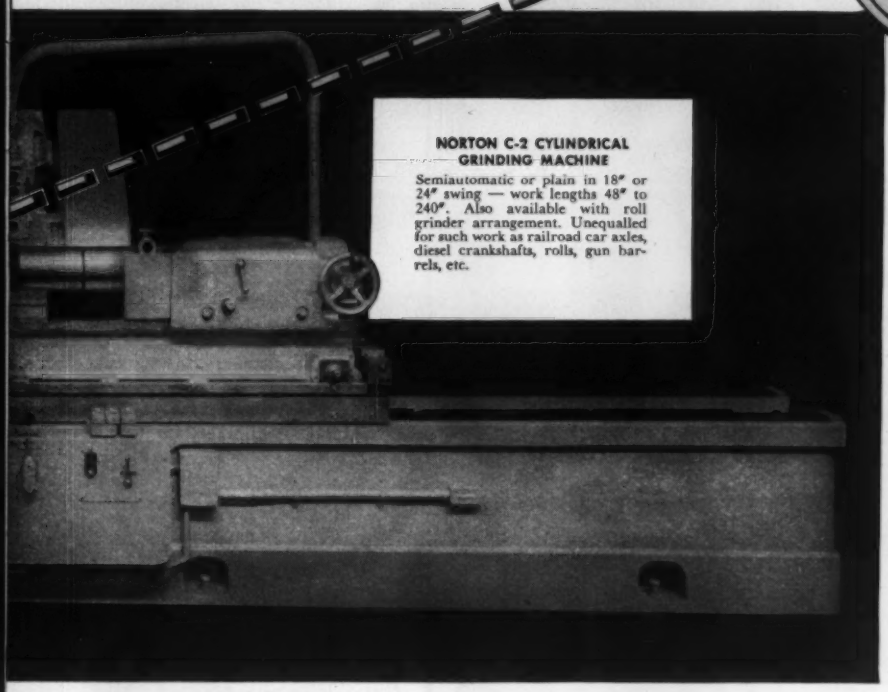
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Semiautomatic or plain in 18" or 24" swing — work lengths 48" to 240". Also available with roll grinder arrangement. Unequalled for such work as railroad car axles, diesel crankshafts, rolls, gun barrels, etc.

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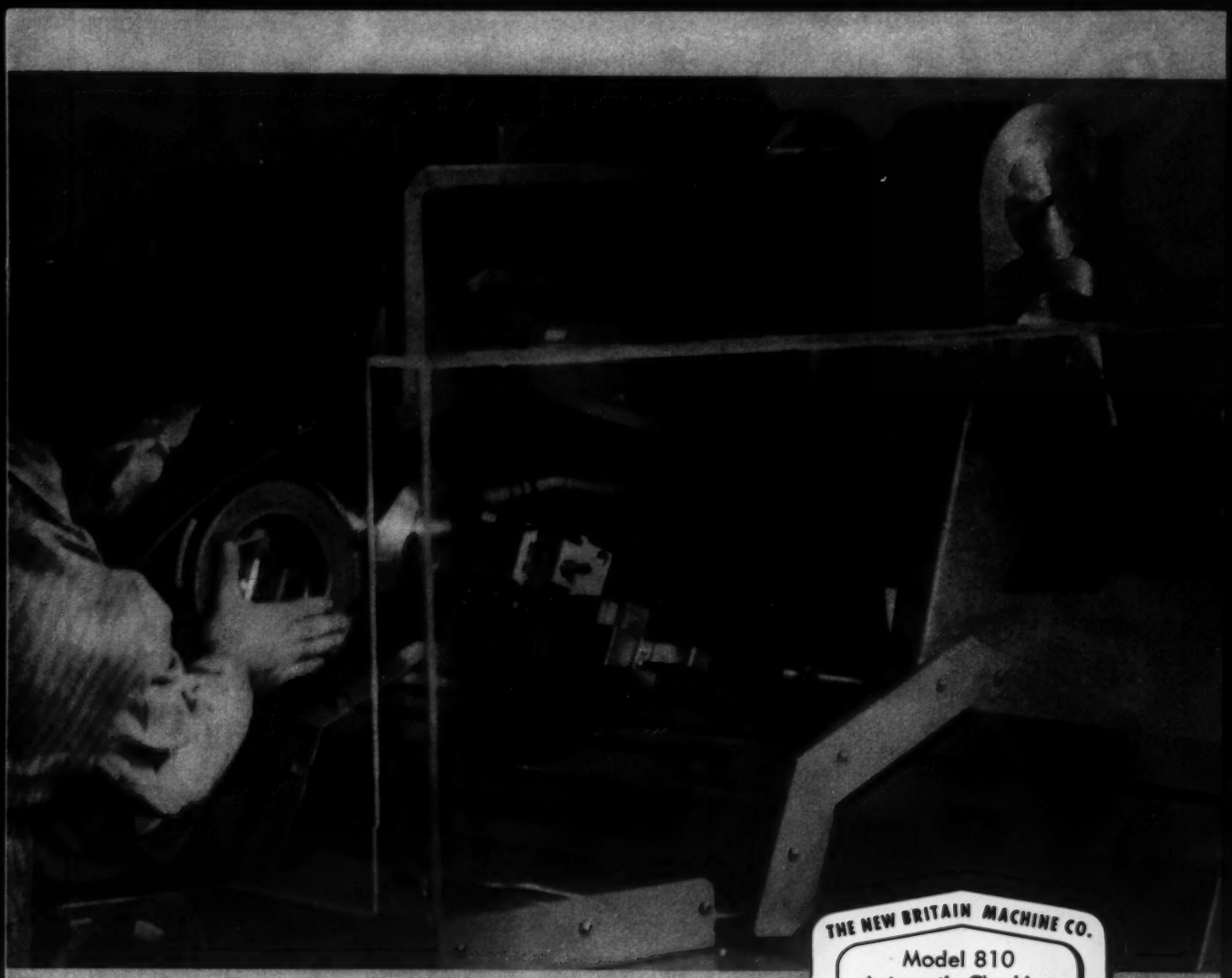

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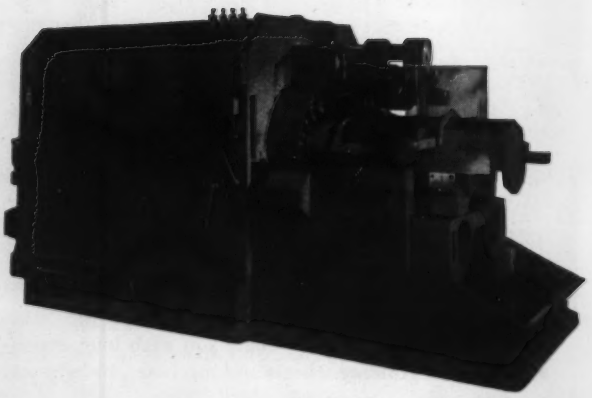

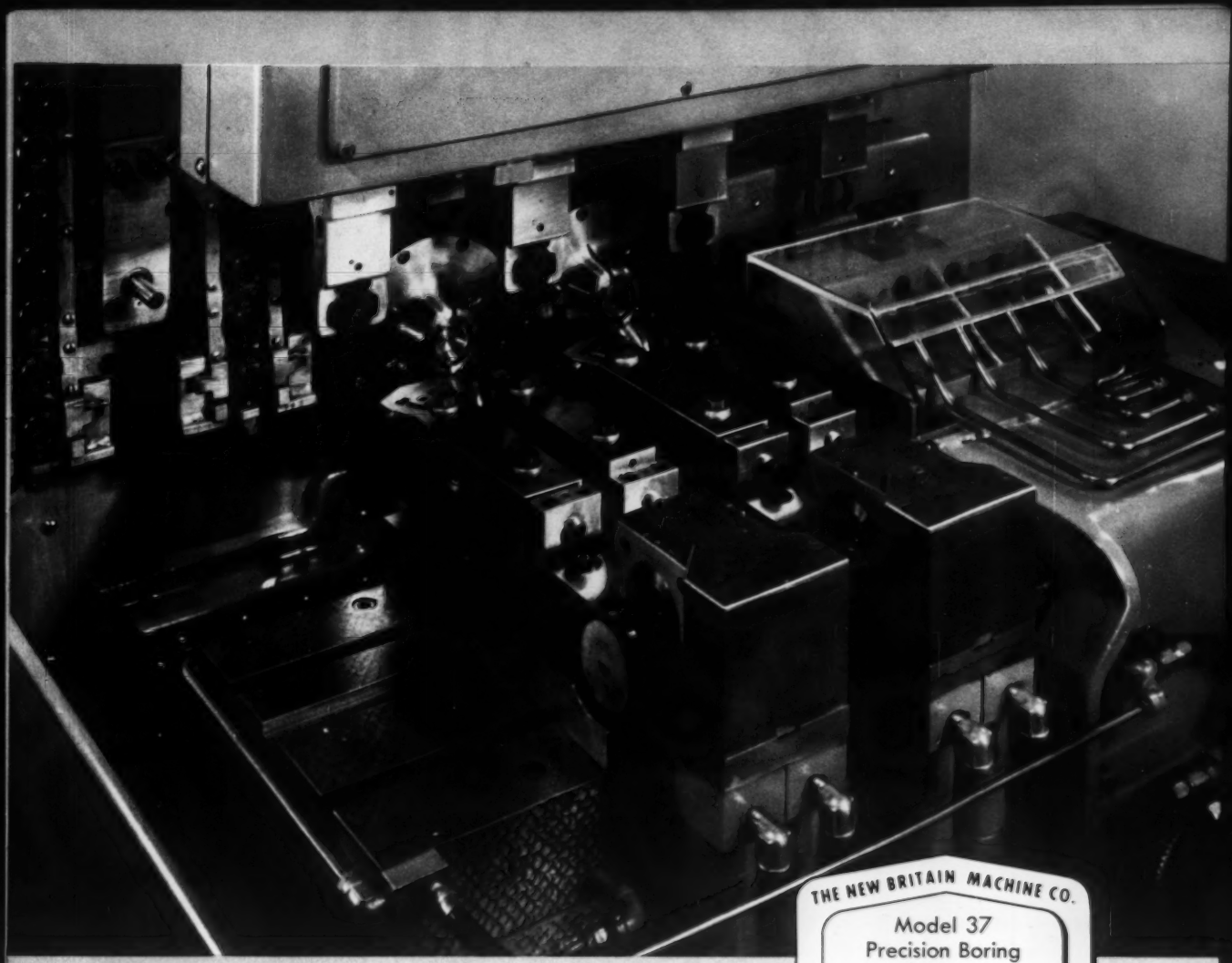

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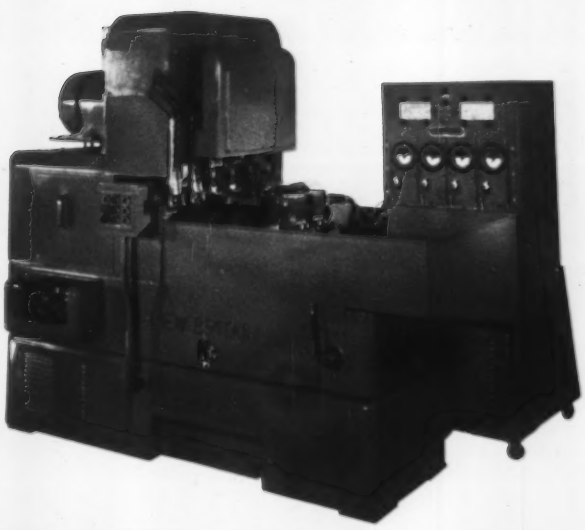
As successive pieces approach the limits of a ±.0025 inch tolerance, the tools reset themselves to size. With automatic loading, automatic gaging and two-at-a-time production, this and other New Britain Precision Boring Machines can cut costs for you. Please turn the page for more about New Britain Boring Machines.



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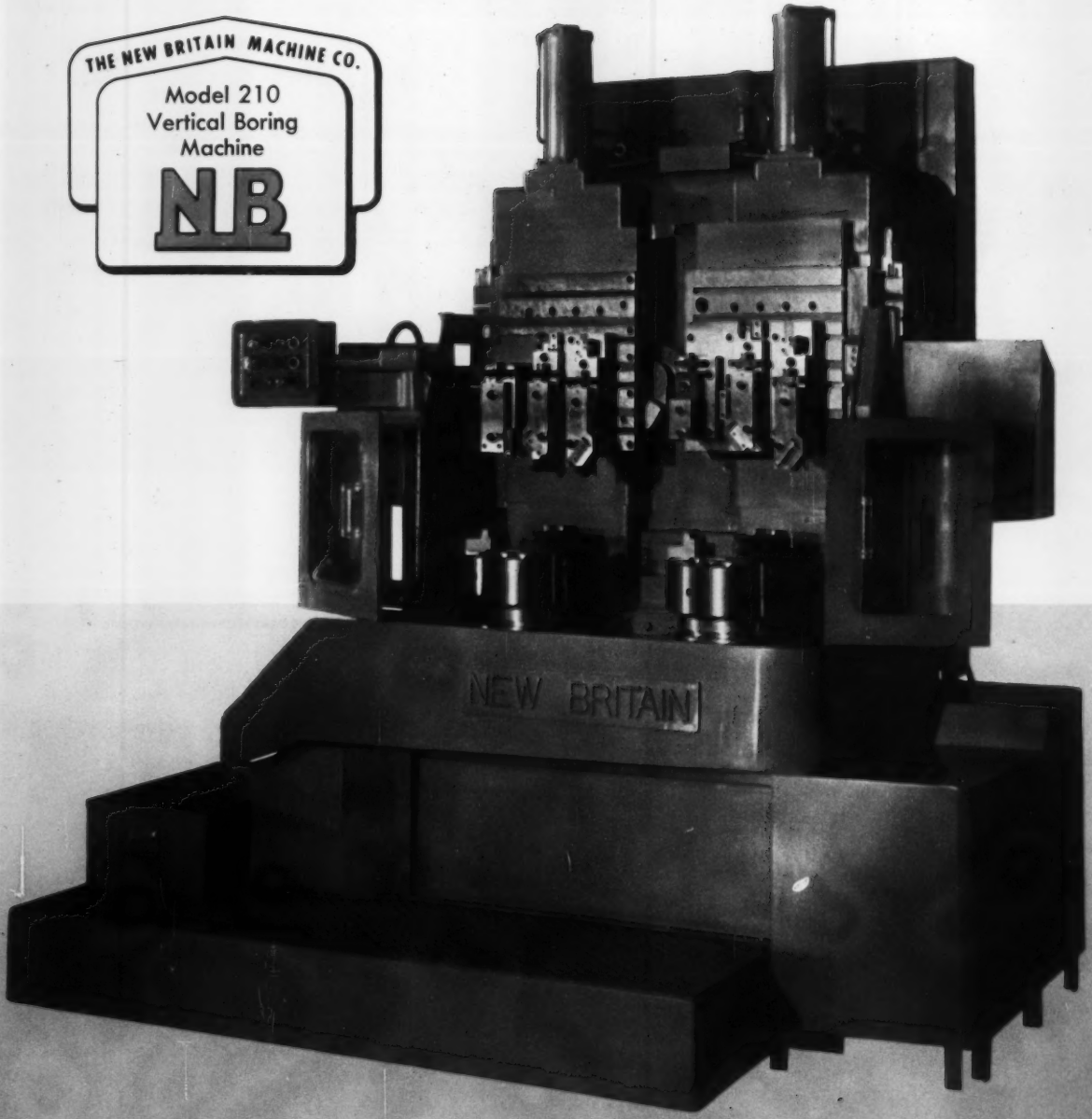

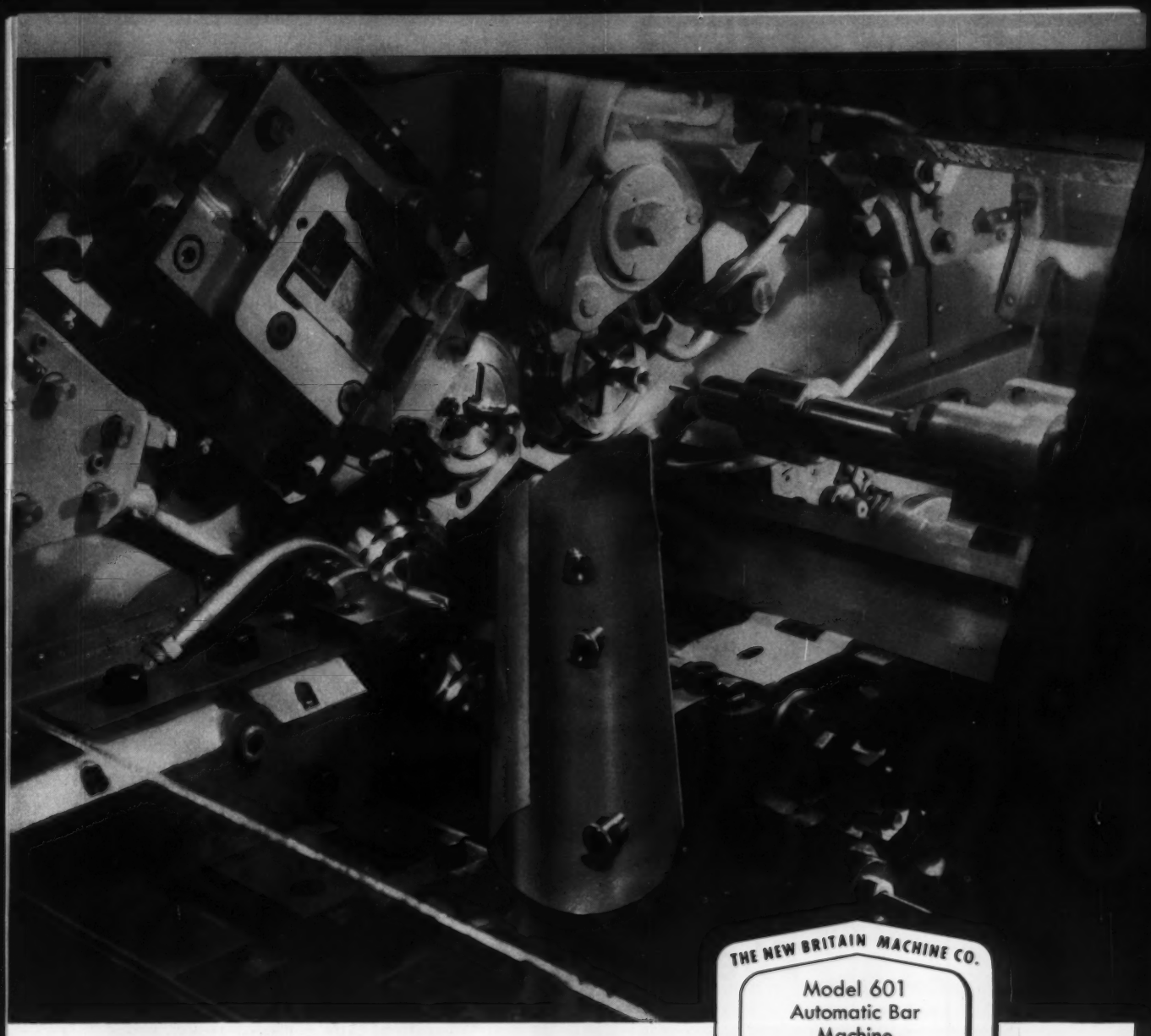

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Model 601
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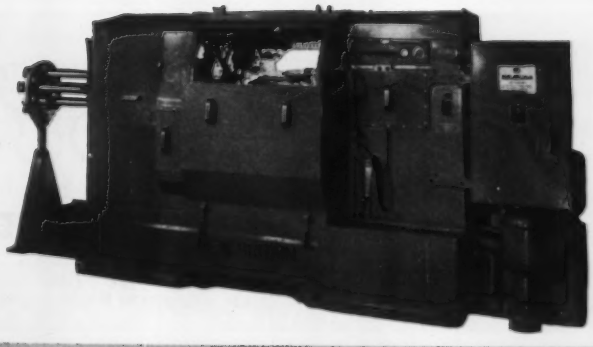
built for the carbide age

This rugged, powerful, fast automatic has what it takes to get full mileage out of the tremendous advances in tools. Check with your New Britain man on this big cost-cutting possibility.



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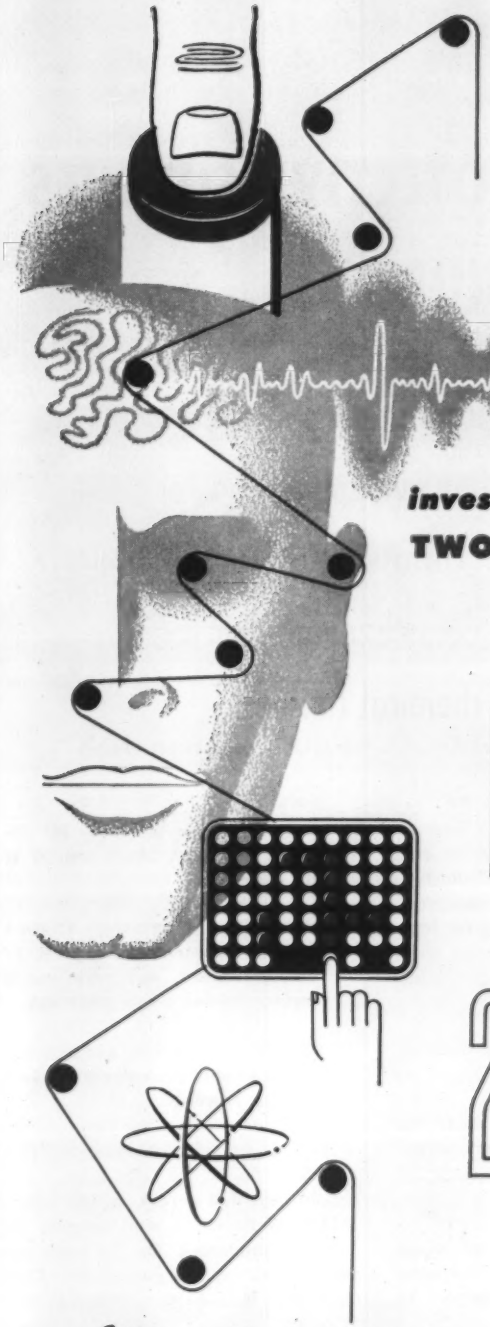

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A SPECIAL REPORT ON PROTECTIVE FINISHES FOR ALUMINUM

Most aluminum producers and fabricators are well aware of the superiority of chemical finishes over anodizing for the protection of aluminum from corrosion. Naturally, then, there is a running battle for acceptance among the leading producers of the protective chemical finishes.

That's why, here at Allied, we have always studied your needs with regard to both our own and competitive processes. We're constantly trying to produce new and better finishes because we believe there's always room for improvement . . . even to our own products. Some years ago this policy led to the introduction of a process, long in development, that offered you a way to overcome anodizing's obvious technical complications . . . Iridite #14. This finish was far easier to use than anodizing, yet provided comparable, if not superior, quality. And, its cost was much less than anodizing.

But other finishes offering similar advantages over anodizing have entered the market. So . . . the current battle for acceptance. By any cost comparison Iridite #14 is the most economical. However, corrosion tests by users show contradictory results as to performance from Iridite #14 and other leading protective finishes for aluminum. Most tests show Iridite #14 superior, but some do not. The margin of difference, however, is always small. The truth is that all have proved good. However, our laboratory research indicated that still further improvements could be made.

That knowledge . . . plus our aim to give you even better protection and maintain the leadership of the industry, is exactly why Allied Development Engineers have been working for long years to develop a better finish than any of those now available, including our own Iridite #14.

Now the new finish is ready for you. It's called Iridite #14-2 (Al-Coat).

From a performance standpoint, Iridite #14-2 gives you two important advantages in the protective finishing of aluminum.

FIRST: in its fully colored brown film stage it provides corrosion resistance decidedly superior to previous processes.

SECOND: the basic brown film can be hot water bleached to produce a clear-type film with protection heretofore unobtainable from clear-type chemical finishes.

From an operating standpoint, new Iridite #14-2 gives you three important advantages.

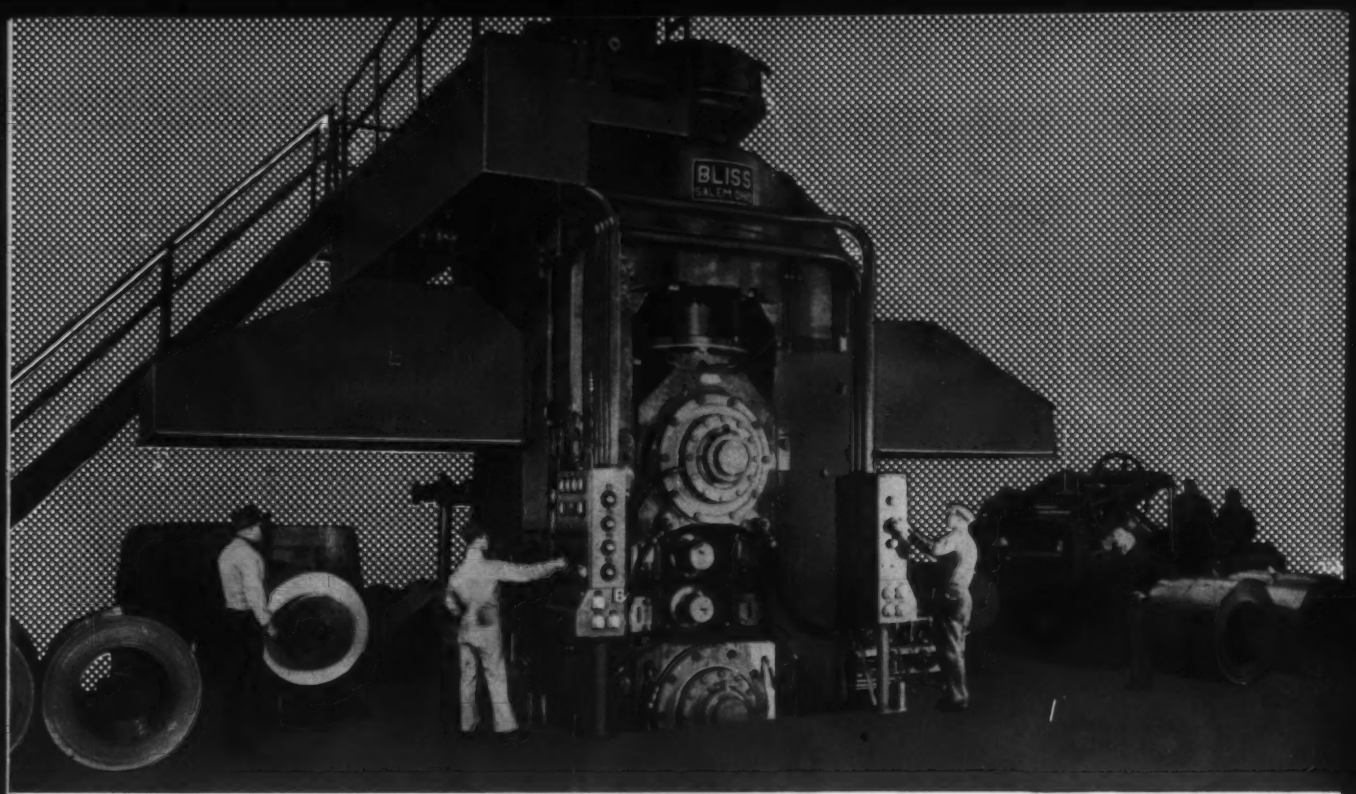
FIRST: it provides consistently higher corrosion resistance for different aluminum alloys treated in the same bath.

SECOND: it provides a more uniform appearance for parts of different alloys and with varied surface finishes before treatment.

THIRD: its operating and technical characteristics are superior to those of other processes.

If you are using or planning to use a chemical finish for aluminum, you should have full details on new Iridite #14-2. Write us or send samples for free test processing. Or, for more immediate advice, call your Iridite Field Engineer. He's listed under "Plating Supplies" in your classified telephone book. - - - ALLIED RESEARCH PRODUCTS, INC., 4004-06 EAST MONUMENT STREET, BALTIMORE 5, MARYLAND.

P. S. Even new Iridite #14-2 will be constantly measured against both your needs and competitive processes to make sure you get the best possible, most economical finish for your product that man and the laboratory can develop.



Each minute...up to 1700 feet of cold rolled steel from

Newport Steel's New Bliss Cold Reversing Mill

This big Bliss mill has proved out "above expectation" in early test runs, and is now operating full time at Newport Steel Company's Newport, Kentucky, mill.

Working at speeds up to 1700 feet per minute, it reduces hot-rolled pickled strip in various gages and up to 48" widths. Its automatic coil handling equipment on both the entry and delivery end keeps pace with mill speeds, and is capable of handling coils up to 40,000 pounds.

Like all Bliss cold reversing mills, this Newport, Kentucky, installation is significant for its ease of operation. The mill is designed for fast changes, and centralized controls make possible virtually instantaneous adjustment while the mill is in operation.

This is just one of a complete line of Bliss rolling mills and accessories for both ferrous and nonferrous applications: two-high, four-high and cluster mills of Bliss manufacture are found in leading metal-producing plants throughout the world.

If you're interested in seeing how others have solved difficult cold and hot rolling problems, write for a copy of our recently revised Rolling Mill Brochure (Bulletin 40-A).

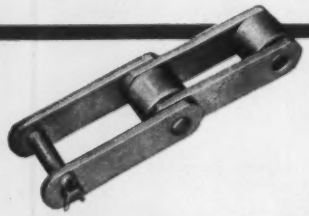
BLISS
SINCE 1857

is more than a name...it's a guarantee

E. W. BLISS COMPANY
ROLLING MILL DIVISION, Salem, Ohio
Presses, ROLLING MILLS, Special Machinery

U. S. Plants in Canton, Cleveland, Salem and Toledo, Ohio; Detroit and Hastings, Michigan; San Jose, California; Pittsburgh and Midland, Pa. *Branch Offices in* Burbank, Chicago, Cleveland, Dayton, Detroit, Indianapolis, New Haven, New York, Philadelphia, Pittsburgh, Rochester, Salem, San Jose, Toledo, Washington, D. C.; and Toronto, Canada. *Other representatives throughout the world.*
E. W. Bliss (England) Ltd., Derby E. W. Bliss Co. (Paris), France

For longer chain life, here's
less bushing and joint wear



Large-diameter rollers of Link-Belt SS chains reduce chain-pull due to frictional resistance.

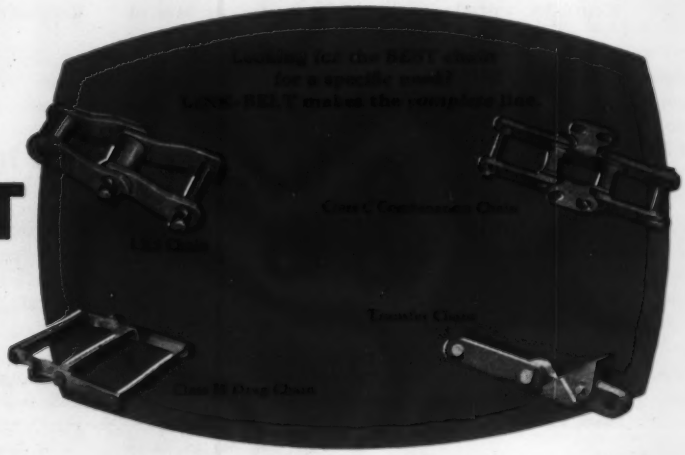
LINK-BELT SS roller chains are designed for abrasive, heavy-duty service

FOR hard-working drives and conveyors, choose Link-Belt SS bushed roller chain. Its hardened steel joint assures longer life in gritty and abrasive applications. Accurately machined parts provide a firm, tight fit of pins and bushings in the steel sidebars. In addition, accurate control of raw material specifications and manufacturing processes results in uniformity . . . longer life.

Whatever your particular chain requirements in regard to speed, weight of loads or severity of service—the completeness of the Link-Belt line will provide the right answer. No other manufacturer offers such a broad range of silent and roller chains—of cast, combination, forged and fabricated types. And a complete selection of attachments permits efficient adaptation to varied services.

For help with any chain problem—big or small—call your local Link-Belt office or authorized stock-carrying distributor. He is qualified to make an unbiased recommendation of the one chain best-suited to your exact needs.

Link-Belt Class SS roller chain assures steady, even flow of fabricated products from medium-temperature industrial oven manufactured by The W. W. Sly Manufacturing Co., Cleveland, Ohio. Link-Belt precision steel roller chain and roller bearing blocks are also used.

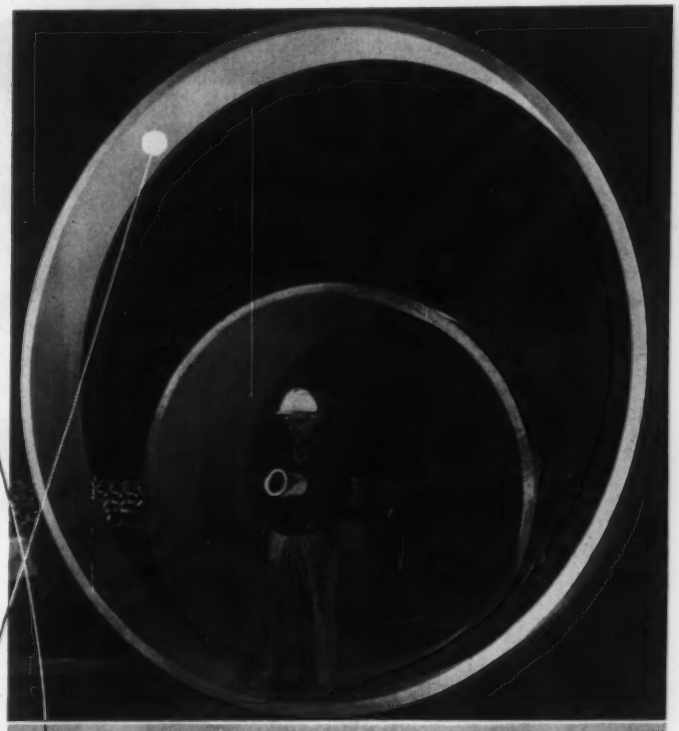


LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, 307 N. Michigan Ave., Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office: New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 13,000

Machining time reduced by using Edgewater Rolled Steel Rings



Weldless steel rings of simple or complex cross-sections are readily rolled to close tolerances by Edgewater. The process consists of upset forging of a steel block on a press, followed by the rolling operation, in which powerful mills form shapes such as those shown at the right. Due to the accuracy of the process, a minimum of machining is needed.

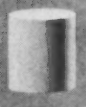
Our engineers will be glad to review your requirements and recommend a shape that will best serve you.

SEND for 12-page bulletin that describes the Edgewater process for making Rolled Steel Rings.

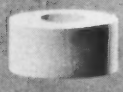
Edgewater Steel Company

PITTSBURGH 30, PA.

how Edgewater Rolled Steel Rings are made:

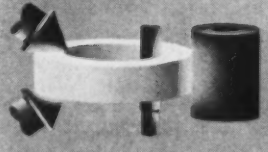


A block of steel is sliced from an ingot or rolled bar. **1**

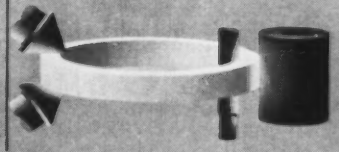


2 After soaking at forging temperature it is upset and punched in a press, forming the "blank."

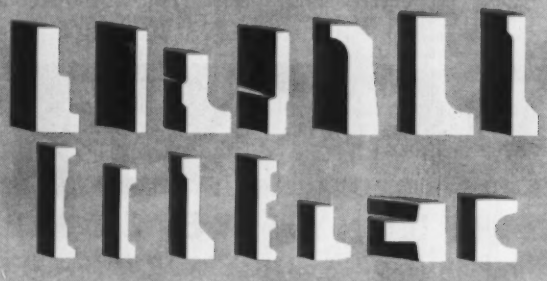
3 The rolling process enlarges the diameter, reduces the thickness, and forms ribs, flanges, etc., as required.



4 The ring is rolled to accurate shape and dimensions, in one continuous process.



typical shapes rolled by Edgewater



MUSIC WIRE

BY

WASHBURN

has reached even higher standards of **QUALITY** than ever before. Our **CADMIUM** plated Music Wire especially merits your careful investigation if you are interested in superior corrosion resistance.

Our **QUALITY** will satisfy you . . . Our **SHIPMENTS** prompt, from ample stock . . . Our **INTEREST** in Customer requirements means "Once a Washburn Customer Always a Washburn Customer"

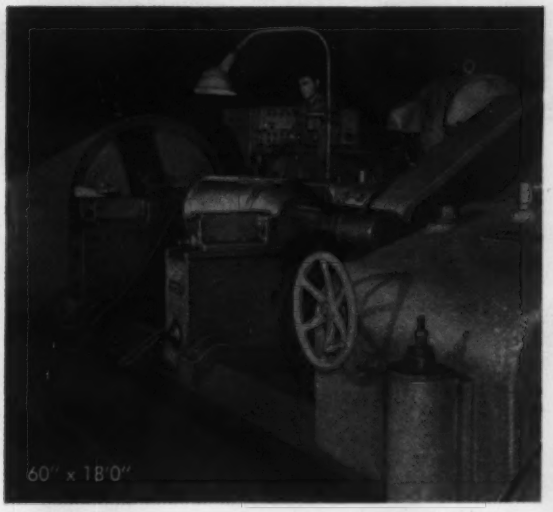
100

WASHBURN

WASHBURN WIRE COMPANY, NEW YORK CITY

CLEAN, UNIFORM BILLETS - STRIP - RECTANGULAR, ROUND, FLAT RODS

TEMPERED AND UNTEMPERED FLAT AND ROUND HIGH CARBON WIRES



They have taken the "GRIND" out of roll grinding at the Aliquippa works of J&L

Drudgery takes a back seat in roll grinding at Jones & Laughlin's Aliquippa Works.

The three Farrel® heavy duty grinders they have are easy to set up, easy to operate, and the required accuracy—whatever it may be—is easy to obtain.

For example: The spindle assembly, including bearings and drive, is designed to give the grinding wheel extremely smooth and accurate performance, when either roughing or finishing. The spindle itself is large in diameter for necessary rigidity under working load.

For example: The automatic crowning device, which grinds a mathematically accurate curve, is simply and quickly set, and requires no manipulation during operation. The same setting produces exactly the same curvature and permits fixed, uniform and easily controlled accuracy of contour in all rolls.

For example: Carriage traverse is reversed electrically, automatically, and dwell can be set for any elapsed time required.

These are only three of the features which take the "grind" out of the operation of Farrel roll grinders. For the full story, send for descriptive bulletin.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT

Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, New York, Akron, Chicago, Fayetteville (N. C.), Los Angeles, Houston

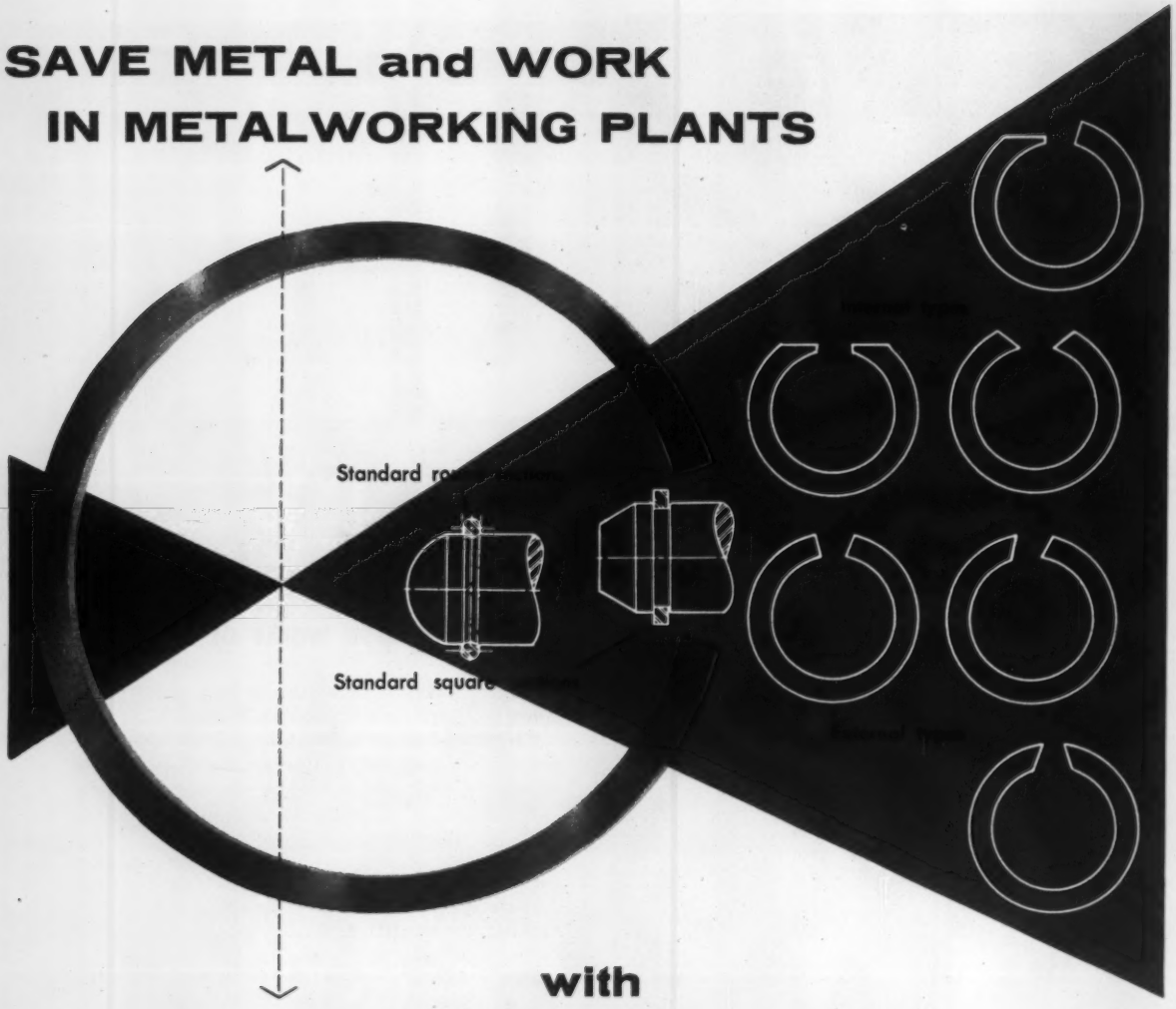
FARREL ROLLING MILL MACHINERY

Rolls • Rolling Mills • Rod Mill Tables and Manipulating Equipment • Universal Mill Spindles • Rod Coilers • Slitters • Gears • Mill Pinions • Pinion Stands • Gear Drives of Any Capacity • Flexible Couplings • Roll Grinding Machines • Roll Calipers

FB-1047

Farrel-Birmingham®

SAVE METAL and WORK IN METALWORKING PLANTS



with

RELIANCE SNAP RINGS

Looking for a way to reduce high product cost? There are two logical places to start . . . material and labor. Combined, these two factors are responsible for the major portion of the cost of any manufactured item.

Reliance Snap Rings are now being employed extensively by engineering and production men to reduce waste of valuable materials and at the same time cut expensive machining and assembly time. Previously it was necessary to machine an oversized shaft to form a shoulder. Now it is possible just to machine a groove and snap in a ring, saving metal from the machine shop floor and many hours of machining time. Snap rings can be used as bearing races, serve as shoulders on shafts or in counterbores. Reliance rings will save time and money for you as they have for so many others. Write for details contained in your free copy of Engineering Bulletin 55.

EATON

RELIANCE DIVISION

MANUFACTURING COMPANY

514 CHARLES AVENUE • MASSILLON, OHIO

SALES OFFICES: New York • Cleveland • Detroit • Chicago • St. Louis • San Francisco • Montreal

PRODUCTS: Sodium Cooled, Poppet, and Free Valves • Tappets • Hydraulic Valve Lifters • Valve Seat Inserts • Jet Engine Parts • Rotor Pumps • Motor Truck Axles • Permanent Mold Gray Iron Castings • Heater-Defroster Units • Snap Rings Springtites • Spring Washers • Cold Drawn Steel • Stampings Leaf and Coil Springs • Dynamatic Drives, Brakes, Dynamometers

Change motors in minutes—

with FALK *all-steel* MOTOREDUCERS

No long and costly "down time" involved

Motors can be interchanged or replaced *in minutes* with the all-steel, All-Motor type FALK Motoreducer. No long and costly "down time" is involved in making the change!

Best of all, replacement is not limited to original make of motor—new NEMA frames may be substituted for old. This versatile Motoreducer operates with any make, speed or type of standard foot-mounted motor within its AGMA rating. No modification, no special shaft, no "partial" motor required.

In addition to unmatched motor interchangeability, this dependable gear drive—the "work horse of industry"—offers: widest choice of output-shaft position (horizontal, vertical, right-angle)...any output-shaft connection...any mounting, including wall and ceiling...standard speed range from 1.5 rpm to 1430 rpm. All these advantages, plus proved efficiency, low maintenance and extra-long life, make the All-Motor type FALK Motoreducer your best buy for any job requirement.

Furnished in sizes up to 75 hp with any make, style or type of motor; or, *without a motor if desired.* FALK Motoreducers are available from convenient factory, field or distributor stocks, from coast to coast.

Write for Bulletin 3100

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

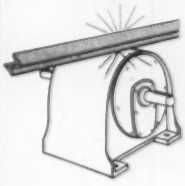
MANUFACTURERS OF:

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

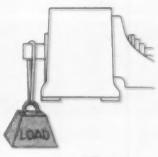
...a good name in industry

FALK "IN-BUILT" FACTORS assure full dependability—better service—longer life



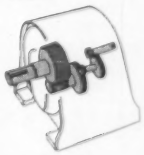
ALL-STEEL HOUSINGS

Rugged, strong, rigid ...all parts heavy steel plate, formed and welded in the Falk Weld Shop.



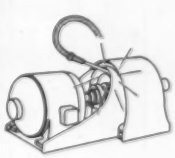
LARGE OVERHUNG LOAD CAPACITY

Large shafts, oversize bearings...rigid mountings with wide bearing spans to handle maximum loads.



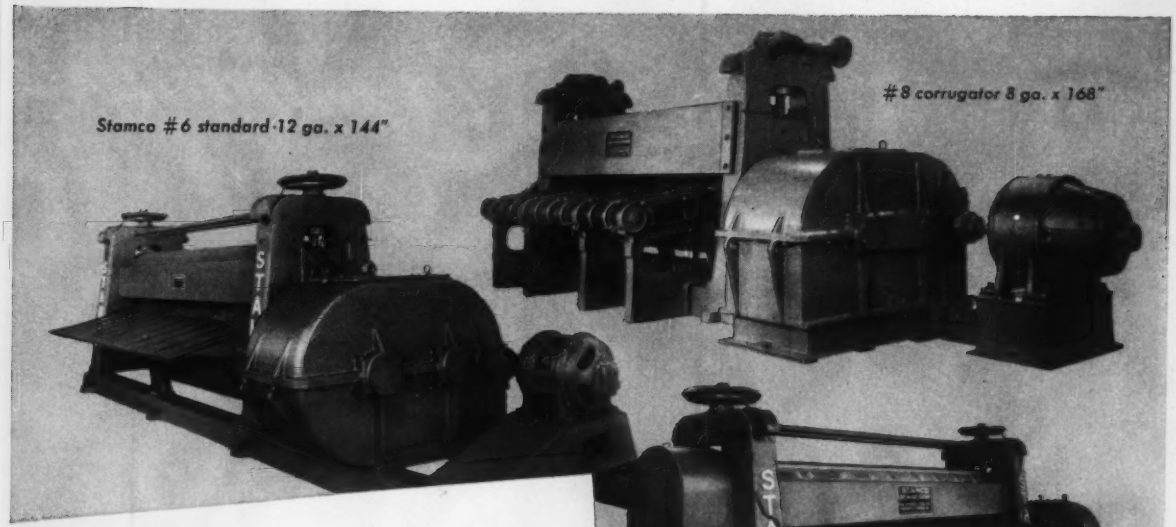
PRECISION GEARING

Heat-treated alloy steel gearing, precision cut and shaved after heat treatment to eliminate distortion.



SEALED HOUSINGS

Splashproof, dustproof, oiltight. Dual closures and one-way vents keep oil in, dust and moisture out.



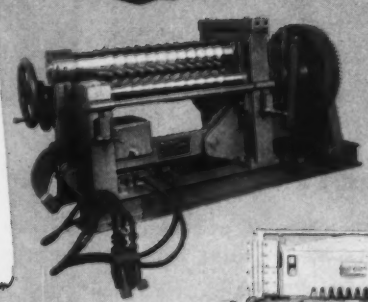
Stamco #6 standard 12 ga. x 144"

#8 corrugator 8 ga. x 168"

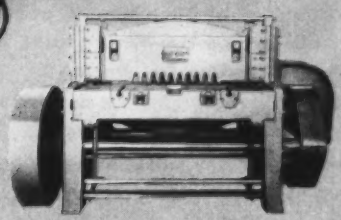
For Roll Corrugating and Culvert forming . . . see

Stamco

Stamco #6A high speed corrugator



Stamco 8 ga. Culvert Curving roll



Stamco 8 ga. x 36" corrugated shear

Stamco high duty Culvert Punch and Riveter equipped with air operated friction clutch

Stamco standard Culvert Punch and Riveter

STAMCO, Inc., New Bremen, Ohio

another revolutionary development by La Salle

THE NEW fatigue-proof STEEL BAR

gives HIGH STRENGTH... WITHOUT HEAT TREATING

"FATIGUE-PROOF" steel bars offer high strength in-the-bar . . *without the expense and trouble of heat treating.* Tensile strength is in the 140,000 to 150,000 p.s.i. range . . hardness, which is related to this strength level, is approximately 30 Rockwell "C."

"FATIGUE-PROOF" has uniform strength across the bar . . and this uniformity is maintained from bar to bar . . lot to lot. This remarkable uniformity of strength makes "FATIGUE-PROOF" ideal for applications in the 140,000 to 150,000 p.s.i. range that formerly required heat treated carbon and alloy steels, either hot rolled or cold drawn.

yet it's EASY TO MACHINE

"FATIGUE-PROOF" machines at least 25% faster than annealed alloys . . 50% to 100% faster than heat treated alloys.

"FATIGUE-PROOF's" excellent machinability permits faster speeds, heavier feeds, better tool life . . your production rates will increase.

Distortion from machining is held to a minimum . . surface finish is greatly improved.

Our Sales Engineers will be happy to show you how you can cut costs and eliminate problems and provide samples for test purposes.

JUST PUBLISHED! Ask for your copy of this new 20-page booklet which gives additional information on the remarkable new "FATIGUE-PROOF."

La Salle STEEL CO.

1414 150th STREET · HAMMOND, INDIANA

Manufacturers of America's Most Complete Line of Quality Cold-Finished Steel Bars

LA SALLE STEEL CO.
1414 150th Street
Hammond, Indiana

Please send me your "FATIGUE-PROOF" Bulletin.

Name_____

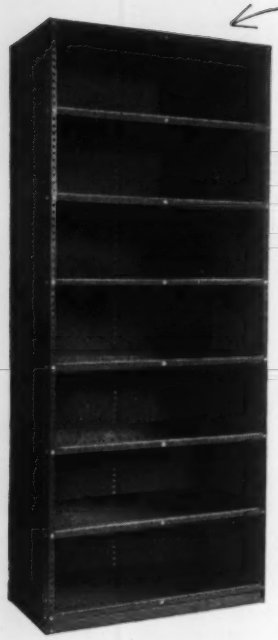
Title_____

Company_____

Address_____

City_____ Zone____ State_____

HOW TO USE HALLOWELL ADJUSTABLE SHELVING



SELECT THE BASIC SHELVING UNIT

USE IT INDIVIDUALLY

OR IN COMBINATION

CLIP IN DIVIDERS

PUT IN SHELF BOXES

ADD SLOPING SHELF UNITS

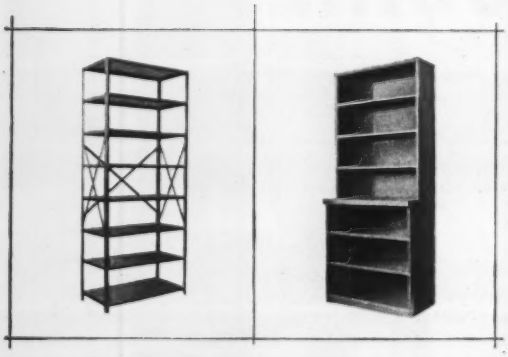
AND

BIN FRONTS

AS NEEDED

ATTACH SWINGING

OR SLIDING DOORS



Baked-on Enamel Finish · Sturdy Steel Construction · Interchangeable Parts Easy to Assemble · Stocked by Leading Shop Equipment Dealers · Send for Bulletin 2057 · Hallowell Shop Equipment Division · Standard Pressed Steel Co., Jenkintown 33, Pa.

HALLOWELL SHOP EQUIPMENT DIVISION

STANDARD PRESSED STEEL CO.

SPS

JENKINTOWN PENNSYLVANIA

BENCHES (CABINET, WORK, UNIT) • STOOLS AND CHAIRS • SHOP DESKS • TOOL STANDS AND CABINETS • DRAWERS, DRAWER TIERS • STEEL CARTS • SHELVING

Customer reports

80% Savings

in Machining Time with . . .

BULLARD

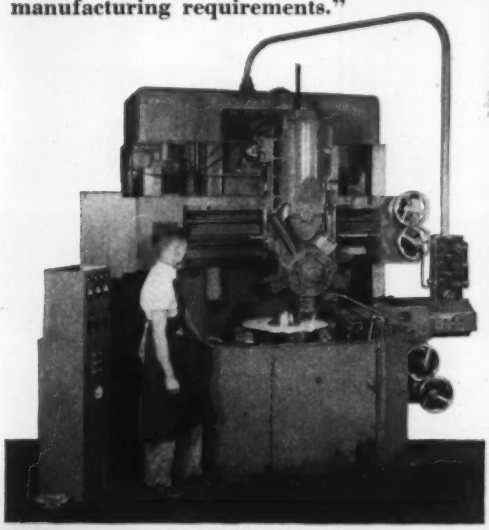
CUT MASTER V.T.L.

MODEL 75

At the York, Pennsylvania plant of the York Corporation, manufacturers of refrigeration and air conditioning equipment, the new 36" Cut Master is running 24 hours a day machining hubs and covers for a turbo compressor impeller wheel.

They have calculated an 80% savings in machining time on the hub disc and 82.3% on the cover disc. As a result, the overall savings in all manufacturing operations for the turbo wheel amounts to 57.7%.

"The quality of the machined finish that we get with our new Cut Master, Model 75," says Mr. R. P. Feiser, Industrial Engineer, "is of such high standard that hand finishing is not necessary to meet our exacting manufacturing requirements."



These same savings can be applied to your manufacturing cost problems — for full information call your nearest Bullard Representative or mail coupon for Catalog to

THE BULLARD COMPANY
286 CANFIELD AVE.
BRIDGEPORT 2, CONN.

PLEASE SEND ME A COPY OF THE NEW CUT MASTER, V.T.L., Model 75 CATALOG

NAME_____

COMPANY_____ POSITION_____

ADDRESS_____

CITY_____ ZONE_____ STATE_____

HOUGHTON RUST VETO can make YOU happy, too!

Yours may not be a problem of keeping the blades of a pocket knife bright and shiny—the way Scouts like them—but this is an example of how Houghton helps in solving rust prevention problems.

In this case, the inhibitor had to keep rust from forming during processing, on the store shelf and in shipment—it had to be free from any effect on the non-metallic parts—and it had to be "invisible".

Houghton's ability to solve "pocket-size" rust prevention problems like this is just a small example of how the complete line of Houghton Rust Vetos can help you in your rust prevention problems. Call on the Houghton Man—outline your needs to him—and costly rust and corrosion losses will be stopped. E. F. Houghton & Co., 303 West Lehigh Avenue, Philadelphia 33, Pennsylvania.

RUST VETO
... products of

E F HOUGHTON & CO.
PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

Ready to give you on-the-job service . . .

HERE ARE A FEW OF THE POPULAR HOUGHTON RUST VETOS

RUST VETO 266

Primarily used for the neutralizing of fingerprints, it is actually a combination of rust preventive, cleaner and neutralizing agent. It possesses water displacing properties and forms a thin film on the metal which will remove drops or films of water by preferential wetting of the metal surfaces.

RUST VETO A-2

One of Houghton's oldest and best known preventives. It is a light solvent type which leaves a waxy, firm film, easily removed by solvent.

It is used for indoor protection of highly finished parts, stored or wrapped for shipment, such as tools, dies or gauges. It will withstand over 300 hours in the humidity cabinet at 100°F.

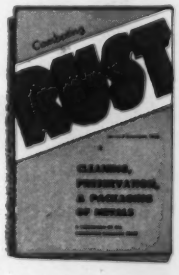
RUST VETO 377

A solvent polar type preventive, outstanding for long term indoor or shed storage. Its water displacing ability is useful in protecting parts already exposed to humidity. Providing a soft but durable .0005" film which can be removed by solvents, this product is applicable at minus 5°F. It withstands 30-day humidity cabinet test at 100°F.

RUST VETO 344

A dark colored solvent solution, free from rosin or sediment, and drying rapidly so as to permit handling within one hour. It is readily removed by solvents.

It is recommended for the protection of metals stored outdoors and other applications where a dry, dark film is desired. This product shows no corrosive tendency toward steel, brass, aluminum or copper. An even film will be maintained down to 20° above zero without cracking.



Write for your copy of "Combating Rust"—a 72-page manual on all phases of rust prevention.

A SUNDAY DRIVE ON 32 SPOT WELDS

YES . . . even your automobile wheels are assembled with Sciaky Resistance Welding

Every weekend millions of families just like yours take their Sunday drive in automobiles with spot welded wheels!

Every *day* of the week outstanding manufacturers like Motor Wheel are turning out thousands and thousands of those wheels with Sciaky patented Three-Phase resistance welding . . . faster and at lower cost than ever before!

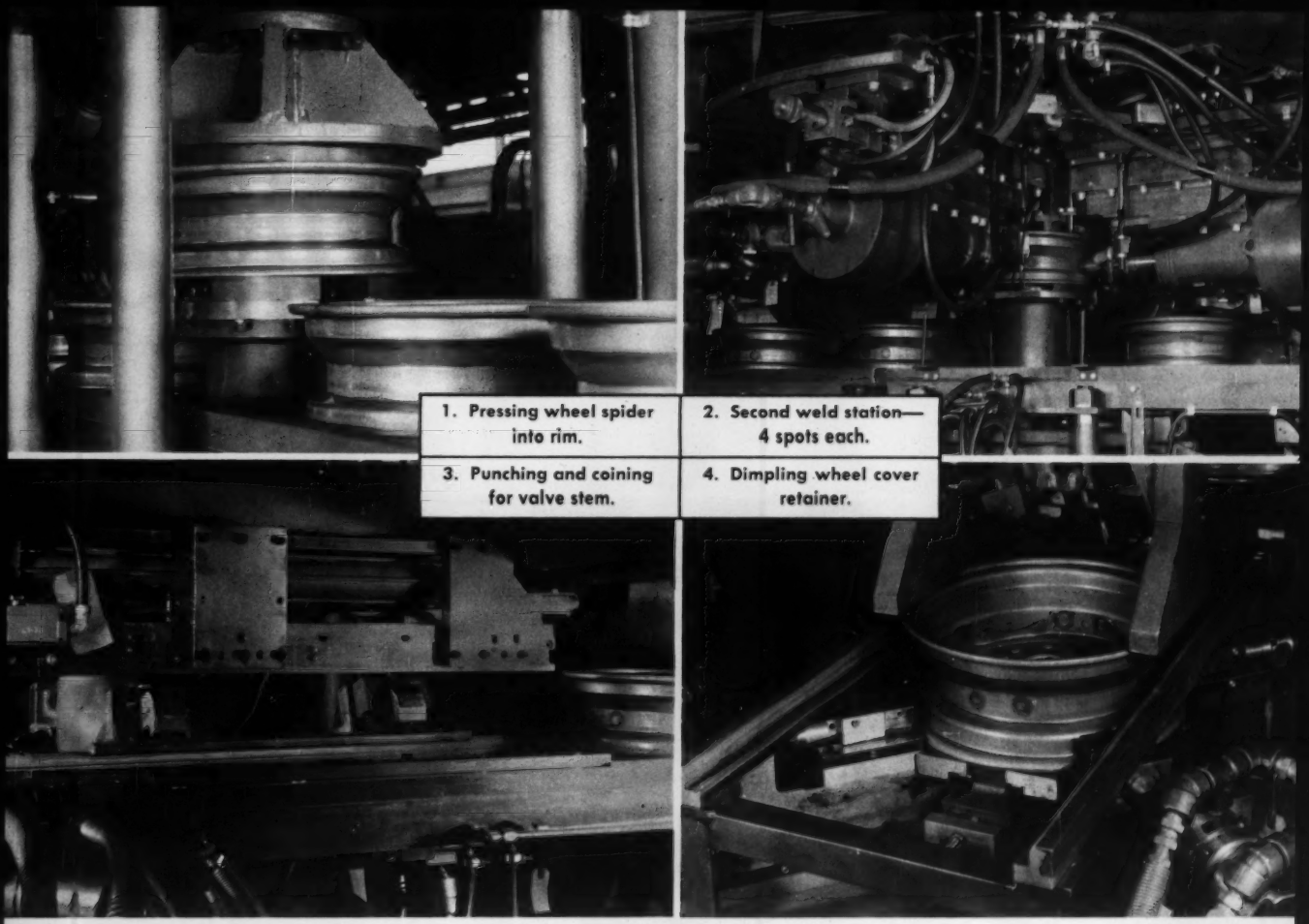
And as for *quality* — years of exhaustive testing proved eight Sciaky spot welds better than the previous twelve precision rivets.

Whether *you* make automobile wheels or not, if you *do* join metals in production . . . if you want it faster and better and at lower cost . . . see about Sciaky resistance welding — just like the wheel people did!

SCIAKY®

Largest Manufacturers of Resistance Welding Machines in the World

Turn the page for the impressive details of this tremendous improvement in wheel fabrication ▶



1. Pressing wheel spider into rim.
2. Second weld station—4 spots each.
3. Punching and coining for valve stem.
4. Dimpling wheel cover retainer.

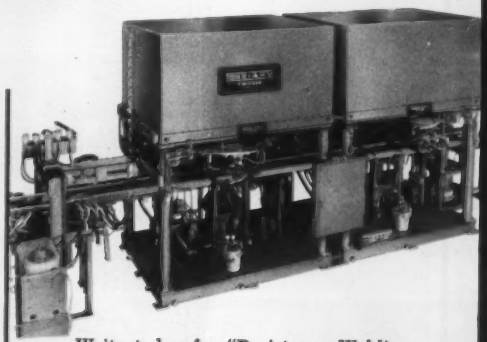
Sciaky Resistance Welding Techniques readily satisfy critical primary structures

with weld integrity and consistency in high production

Today Motor Wheel and other leading manufacturers are fabricating critically stressed automobile wheels with eight Sciaky Three-Phase spot welds instead of the previous twelve precision rivets. The elimination of the holes for rivets or other mechanical fastenings satisfies the air-tight requirements for tubeless tires as well.

A true example of automation, fully automatic Sciaky equipment includes press assembly of parts, piercing and coining of valve hole, and dimpling wheel trim retainers. Skilled labor no longer needed is made available for other important operations.

This tremendous advance in design concept and production methods is the result of years of exhaustive testing and development. Only Sciaky patented Three-Phase balanced load welding with 85% power factor (compared to 30% for conventional unbalanced load single phase) provides the integrity and consistency necessary to critical wheel assembly.

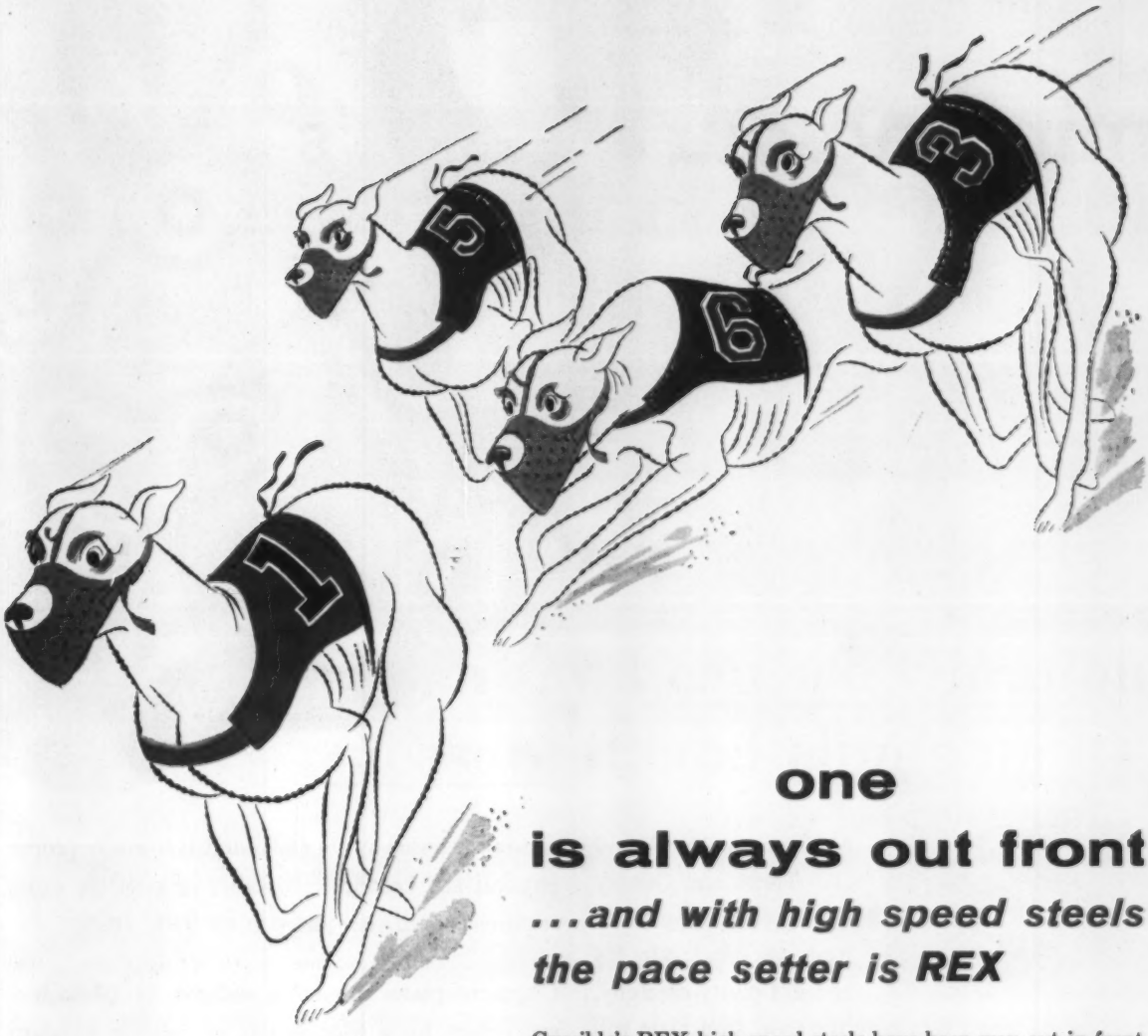


Write today for "Resistance Welding At Work," Vol. 4—#9, completely describing this outstanding application—yet another fine example of Sciaky basic thinking . . . resistance welding techniques to do *more useful work* at *lowest operating cost* with *maximum reliability.*

Largest Manufacturers of Resistance Welding Machines in the World

SCIAKY®

Sciaky Bros., Inc., 4914 W. 67th Street, Chicago 38, Illinois, POrtsmouth 7-5600



one is always out front

...and with high speed steels the pace setter is REX

Crucible's REX high speed steels have been way out in front ever since their introduction. And today they're still the *standard for comparison* wherever high speed steels are used.

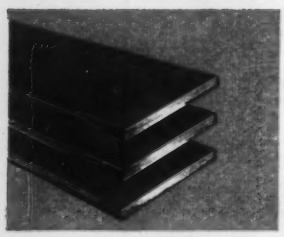
There are many good reasons for REX's leadership – uniformity of size, structure, finish, response to heat treatment, tool performance. Each factor can be proved in your own shop, on your own work. So try this *standard for comparison* on a few jobs and you'll agree with thousands of users – *you can't find a high speed steel to outperform REX.*

Because of its extensive, nationwide use, REX high speed steel is carried in stock by the coast-to-coast chain of Crucible warehouses, or is available on quick mill delivery. *Crucible Steel Company of America, Henry W. Oliver Building, Pittsburgh 22, Pa.*

CRUCIBLE first name in special purpose steels

Crucible Steel Company of America

minding our P's and Q's



At Claymont, the P's and Q's—Plates and Quality—always go together. And we mind our P's and Q's pretty carefully, because we know that only the *right* steel plate will do the job.

When you order Claymont Carbon and Alloy Steel Plates, you are sure of getting exactly the plate you need. Claymont plates are the end products of our own blast furnaces, open hearths and rolling mills—so top quality is controlled at every step. The steel is constantly tested by our metallurgists to assure proper physical and chemical properties to meet the exact requirements of *your* job.

Claymont plates are being ordered by fabricators everywhere for a wide variety of uses—in standard ASTM and AISI specifications as well as special plates for special applications. To get full details on any Claymont steel plates, contact our nearest sales office or write direct to Wickwire Spencer Steel Division, The Colorado Fuel and Iron Corporation, P. O. Box 1951, Wilmington, Delaware.

CF&I **Claymont Steel Products**

Products of Wickwire Spencer Steel Division • The Colorado Fuel and Iron Corporation

Abilene • Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit • El Paso • Ft. Worth • Houston • Lincoln (Neb.)
Los Angeles • New Orleans • New York • Oakland • Odessa • Oklahoma City • Philadelphia • Phoenix • Portland • Pueblo • Salt Lake City • San Francisco • Seattle • Spokane • Tulsa • Wichita
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OTHER CLAYMONT PRODUCTS 3801

Stainless-Clad Plates • Flanged and Dished Heads • Manhole Fittings and Covers • Large Diameter Welded Steel Pipe
Flame Cut Steel Plate Shapes • Lectro-Clad Nickel Plated Steel • High Strength Low Alloy Plates

"You say I can see vibration, measure it, and eliminate it?"

1 "How much vibration do you think my machine has?"

No need to guess—the Veelos Vibration Analyzer shows exactly! This amazing electronic tester measures vibration amplitude down to *2-millionths of an inch*—tests one belt against another, actually shows which belt has "invisible shakes" . . . and how much! Don't guess about vibration; it's costing you hard cash every minute you ignore it. Ask your Veelos salesman to test your belts with the Vibration Analyzer.

2 "Isn't vibration caused by a number of things?"

Vibration can be caused by bearings, motor, clutch, sheaves or V-belts. Quite often it is caused by V-belts alone. The Veelos Vibration Analyzer uses a "strobe" light which "stops" the motion—shows exactly *what* is vibrating! It shows you precisely how much vibration you're paying for, and lets you correct it. The Vibration Analyzer gives positive proof, and the test takes only 15 minutes. It's free, of course.

3 "How do I eliminate costly belt vibration?"

Install Veelos, in place of ordinary V-belts! V-belts have spots of varying density, due to their construction, which throw them out of balance. Veelos belts are absolutely uniform; every stud and link is identical; *every foot of the reel* is identical and uniform; and they're perfectly balanced! Test any belt for vibration against Veelos—you're in for a shock. Your Veelos salesman will show you how to cut costs and improve your operation.

© M.M.&B. Co. 1956

VEELOS
THE BALANCED
LINK V-BELT

Veelos is known as Veelink outside U.S.A.

For free vibration analysis or Veelos Data Book write to:

MANHEIM
Manufacturing & Belting Company
209 Stiegel St., Manheim, Pa.

"Industrial Belt Specialists Since 1911"

Adjustable to any length • Adaptable to any drive • Balanced power • Constant power • Vibrationless power

This C-51 deseaming blowpipe opens transverse plate welds in steel barge bottoms 7 times faster than the previously used process.

Barges get new lease on life...

FOR 70% LESS COST

Deseaming blowpipes have cut the time required to remove these steel barge bottoms from 4 days per barge, to only 1½—and cut costs $500 per barge....

In this operation, the barges were rolled over in the water. Bottom plates were deseamed and removed, and then new plates UNIONMELT welded in position. Before removing the old plates, it was necessary to "open" seam welds, plug welds, and rivets. The deseaming blowpipes did this work with maximum speed and economy—and with minimum nicking into the support members beneath the plates.

Deseaming blowpipes operate with a low-velocity oxygen stream, and make a wide pass in metal at high speeds. The depth of penetration is controlled by regulating oxygen pressure. Lightweight, easy to handle deseaming blowpipes are speeding production and repair operations throughout industry.

For more information on this or any other of LINDE's modern, money saving processes, call your local LINDE representative. Start saving now, call him today.

Linde Air Products Company
A Division of Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.
Offices in Other Principal Cities
In Canada: LINDE AIR PRODUCTS COMPANY
Division of Union Carbide Canada Limited, Toronto
(formerly Dominion Oxygen Company)

Linde
Trade-Mark

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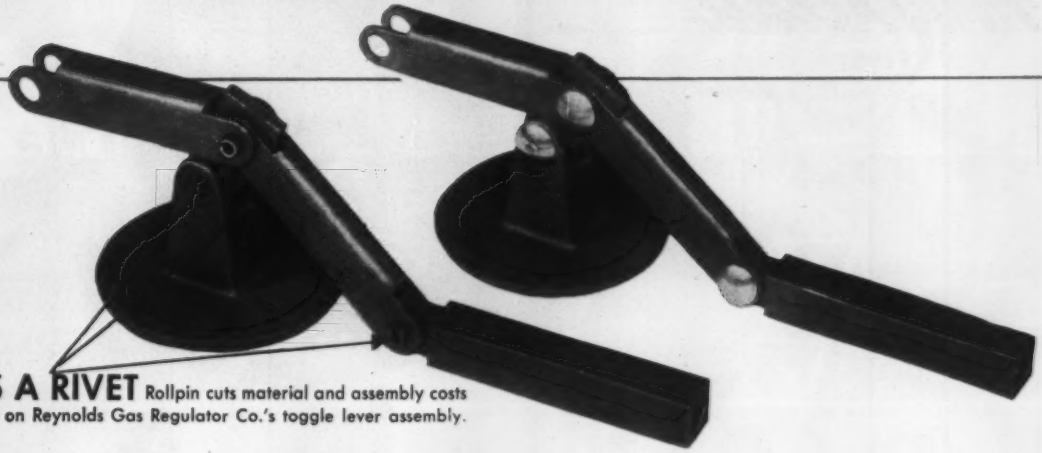
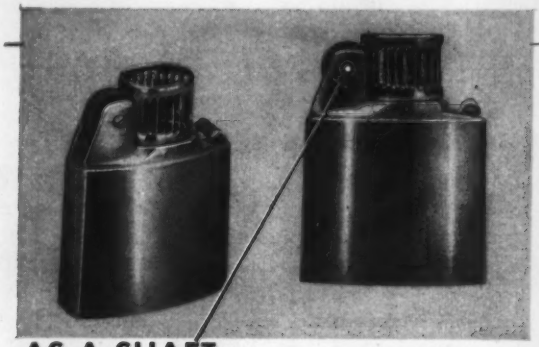
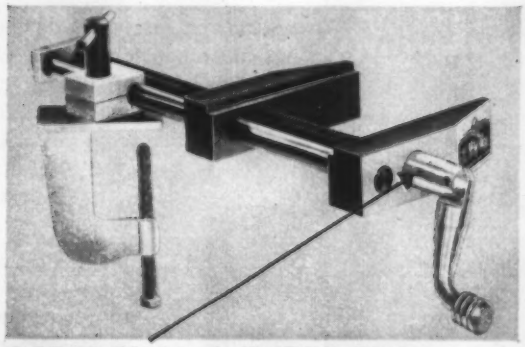
Three typical Rollpin cost reductions



AS A RIVET Rollpin cuts material and assembly costs 25% on Reynolds Gas Regulator Co.'s toggle lever assembly.



AS A SHAFT before and after shot of this Ronson lighter shows how Rollpin made savings of 1½¢ per unit in assembly of spark wheel.



REPLACING A TAPER PIN Rollpin saves 24¢ labor cost on each of American Machine and Foundry's MITY-7-VISES. Eliminates tool cost caused by breakage of small taper reamers.

ESNA® TRADE MARK

ROLLPIN TRADEMARK

Where can you use this simple fastener?

If you use locating dowels, hinge pins, rivets, set screws—or straight, knurled, tapered or cotter type pins—Rollpin can cut your production and maintenance costs as it does in every class of industry. Rollpin is a slotted tubular steel pin with chamfered ends that drives easily into standard holes, compressing as driven. Its spring action locks it in place—withstanding impact loading, stress reversals and severe vibration. No threading, peening or precision drilling needed. Rollpin is readily removable and can be re-used in the same hole.

ELASTIC STOP NUT CORPORATION OF AMERICA

MAIL COUPON FOR DESIGN INFORMATION

Elastic Stop Nut Corporation of America
Dept. R38-260, 2330 Vauxhall Road, Union, N. J.

Please send the following fastener information:

☐ **Rollpin samples**

☐ **Rollpin bulletin**

☐ **Here is a drawing of our product. What self-locking fastener would you suggest?**

Name_____ **Title**_____

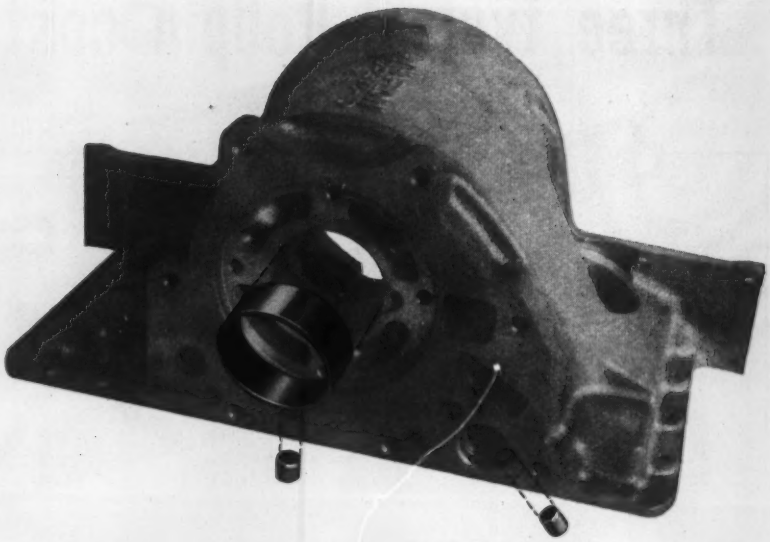
Firm_____

Street_____ **Zone**____ **State**_____

ANOTHER

American

FIRST

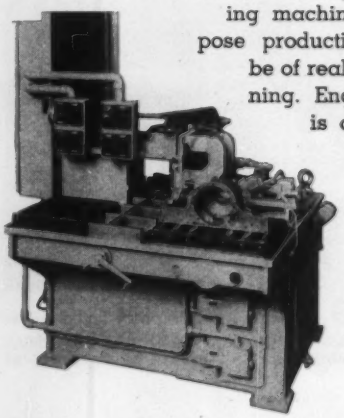


3 parts assembled from 3 different angles

IN ONE AUTOMATIC MACHINE OPERATION

Parts magazines (indicated by arrows) are manually loaded with bushing and plug parts. Transmission case from right hand conveyor is turned 90° and pushed into position by operator. Push button starts machine cycle, case is automatically clamped, and bushing and two plugs are pressed into case simultaneously by hydraulic cylinders. As case is automatically unclamped, operator places it on outgoing conveyor.

Designed for an automotive conveyor-type assembly line this American Hydraulic Press inserts a bushing and two dowel plugs in an automotive transmission case — all three parts from different angles — in a single, push-button controlled, automatic cycle. It is a typical result of the service that American offers for designing and building automatic assembling and broaching equipment.



American's experience in developing machines for special purpose production operations can be of real value to your planning. Engineering versatility is a proven American asset.

A letter or 'phone call outlining your requirements will be welcomed—and will produce prompt cooperation.

AMERICAN *American* BROACH & MACHINE CO.

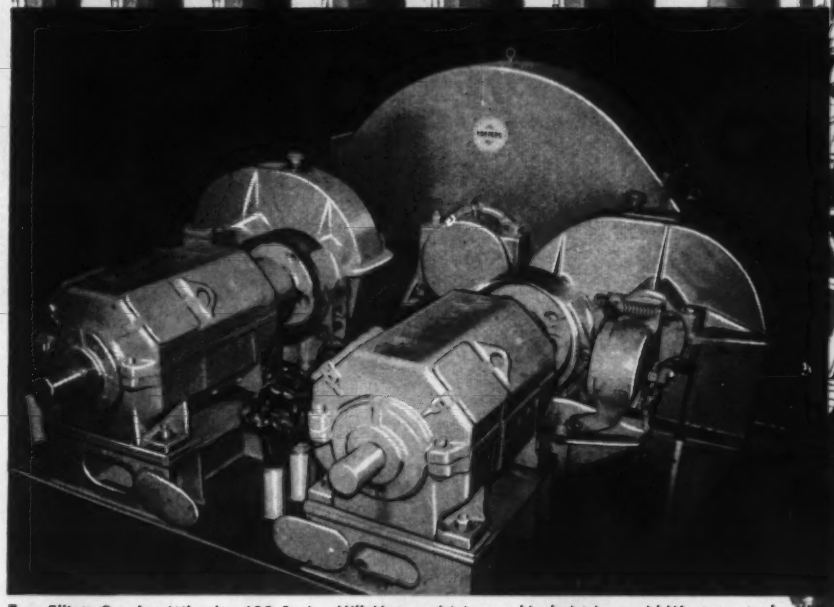
A DIVISION OF SUNDSTRAND MACHINE TOOL CO.

ANN ARBOR, MICHIGAN

SUNDSTRAND

See *American* First — for the Best in Broaching Tools, Broaching Machines, Special Machinery

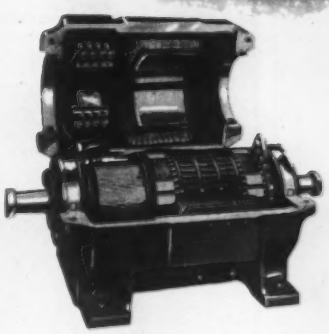
Giving a lift to steel mill skip hoists



Two Elliott Crocker-Wheeler 600 Series Mill Motors driving a skip hoist in a mid-Western steel mi

ELLIOTT C-W MILL MOTORS

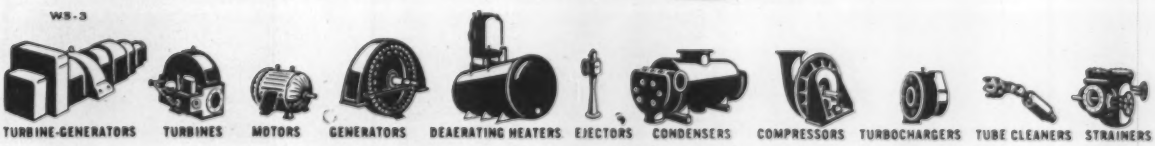
These dependable motors are naturals under rugged, heavy duty operations. They stand up to punishing overloads, constant starting and stopping, reversing strains, etc., and come back for more every time. Their compact durability plus advanced engineering features assure greater power per standard frame size. The tough cast-steel frame is split for easy access to armature, bearings, and field coils. Standard 600 series motors can be readily adapted to separately forced-ventilated, protected self-ventilated or built-in back gear types. For details, ask your local Elliott field engineer, or write for the Mill Motor Bulletin. Address Elliott Company, Crocker-Wheeler Division, Jeannette, Pa.



The split frame is hinged for easy access to all motor parts.

ELLIOTT Company

WS-3



TURBINE-GENERATORS TURBINES MOTORS GENERATORS DEAERATING HEATERS EJECTORS CONDENSERS COMPRESSORS TURBOCHARGERS TUBE CLEANERS STRAINERS

NEW WHITING HEAVY-DUTY TRACKMOBILE® BOOSTS PRODUCTION

Now... get faster, lower cost freight car switching! Speed up car movements in your yard and plant with the new Heavy-Duty Trackmobile. Expedite loading and unloading operations... add new efficiency to traffic handling... give new impetus to higher production.

The versatile Trackmobile hauls, spots and switches... eliminates waste time, demurrage costs, clogged sidings and shipping bottlenecks. Drive it on road wheels to the track—transfer to rail wheels—couple—then pull those loaded cars! The Trackmobile gets *where* you want it *when* you want it! Powerful? It's built for *continuous* use — 'round the clock. Look to the new Trackmobile for new cost savings!

Look at what's new in switching economy

WHITING CORPORATION

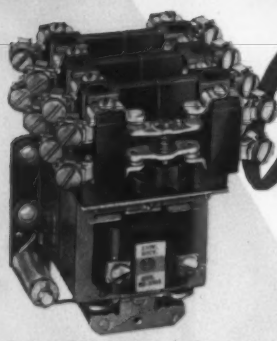
15643 Lathrop Avenue, Harvey, Illinois

Manufacturers of CRANES • TRAMBEAM • FOUNDRY, RAILROAD AND CHEMICAL EQUIPMENT

Discover how the Trackmobile can solve your specific freight car handling problems. Write today for the new Heavy-Duty Trackmobile Bulletin T-115.

Enclosed cab and running lights permit all-weather, 24-hour-a-day operation. On road wheels Trackmobile pulls skids, carts, or portable equipment of all kinds.

The Trackmobile principle of operation has been proved in hundreds of applications in scores of industries.

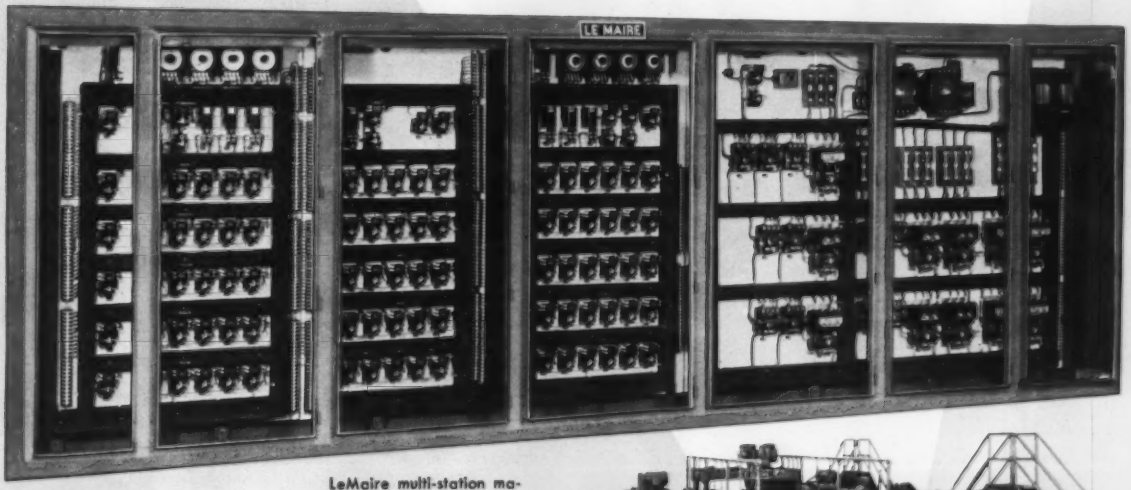


Bulletin 700 BX Universal relay with 4 normally open & normally closed contacts.

OVER 125 ALLEN-BRADLEY

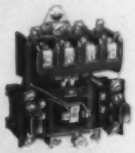
RELAYS, TIMERS and STARTERS

in this LEMAIRE Multiple Station Machine Panel



LeMaire multi-station machine operated by panelboard shown above. A good example of Allen-Bradley solenoid controls in the automotive industry.

Bulletin 709 Size 3 starter. Rated 30 hp, 220 v; 50 hp, 440-550 v.



Bulletin 709 Size 1 starter. Rated 5 hp, 220 v; 7½ hp, 440-550 v.

Bulletin 702 3-pole relay with magnetic hold-in latch. A hum-free relay.

Did you notice the prominence of Allen-Bradley solenoid motor controls at the recent Chicago Machine Tool Show? Manufacturers recognize these reasons . . . the long, trouble free life of Allen-Bradley motor controls . . . their unerring precision in operation . . . the inherent QUALITY of their workmanship and materials.

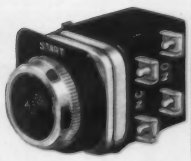
Machinery manufacturers look to Allen-Bradley as a reliable source of control units and components. The A-B trademark is to them and their customers The Sign of QUALITY in Motor Controls.

Send for the Allen-Bradley Handy Catalog. It is a recognized handbook on motor control. Or, let our control specialists help you with your control problems.

Allen-Bradley Co., 1316 S. Second St., Milwaukee 4, Wis.
In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

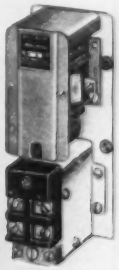
A-B

ALLEN-BRADLEY
QUALITY
TROUBLE FREE
MOTOR CONTROL



Bulletin 800T oiltight push button with NO & NC contacts.

Bulletin 802T adjustable lever limit switch.

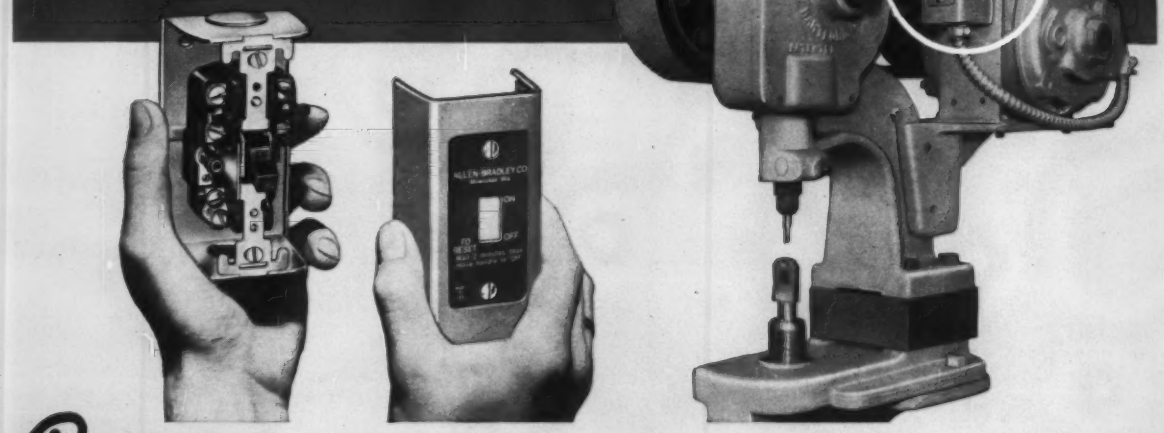


Bulletin 849 pneumatic timer—adjustable from 1/10 to 180 sec.

2-56-R

SMALL MOTORS
need overload protection too!

BULLETIN 600 STARTING SWITCH



Because

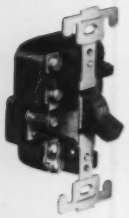
SMALL MOTORS CAN BE AS IMPORTANT TO PRODUCTION SCHEDULES AS LARGE MOTORS

Here is an outstandingly popular starter for applications using motors of ONE HORSEPOWER OR LESS.

It is a small, manually operated starter that is equipped with a time-tested, reliable A-B overload breaker. A soldered ratchet trips the operating lever in case of a sustained overload. It is reset, after tripping, merely by moving the operating lever to the OFF position. Overload heater elements are available to cover the ratings of this starter.

The Bulletin 600 starting switch is available in single and double pole construction. Its double break, silver alloy contacts provide high interrupting capacity. The contacts are always in good operating condition. They never need to be cleaned, filed or dressed. Please write for a copy of Bulletin 600 for complete information on the Bulletin 600 line.

SIMPLE DESIGN

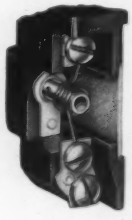


Simple ON & OFF snap switch . . . easy access to terminals . . . ample wiring space . . . silver alloy contacts need no cleaning or maintenance.

ATTRACTIVE APPEARANCE

Streamlined enclosure in grey enamel, and bonderized to assure positive binding of enamel finish to resist corrosion. The pilot light is optional.

OVERLOAD BREAKER



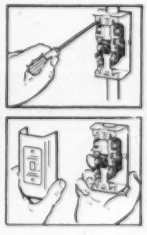
According to National Elec. Code ruling, motors of 1 hp or less, automatically started by thermostat, float switch, etc. must have overload protection.

FITS STANDARD SWITCH BOXES

Bulletin 600 starters fit any standard 2½ in. deep wall switch box.

Can be mounted in machine frame or base. Available with pilot light.

EASY TO INSTALL



Remove 2 screws on front of starter . . . slip off cover . . . attach conduit . . . pull in wires and connect to terminals . . . replace the cover.

VARIETY OF ENCLOSURES

Type 7 for hazardous locations.

Type 4 watertight.

Type 4 with pilot light.

Allen-Bradley Co.
1316 S. Second St.
Milwaukee 4, Wis.

In Canada—Allen-Bradley Canada Ltd., Galt, Ont.

A-B Quality

ALLEN-BRADLEY

BULLETIN 600 STARTING SWITCHES

QUALITY

2-56-MR

How a simple stud strengthens Morgan cranes!

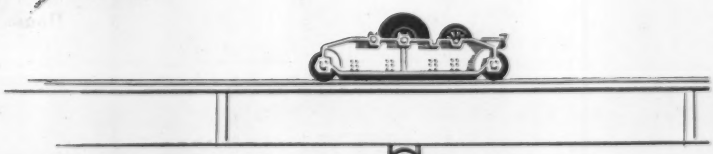
• *Stud welding* of bridge cover plates makes Morgan cranes structurally stronger . . . prevents corrosion inside the girder due to dirt and moisture leaking through holes in the plate . . . stops dangerous scale formation.

Former fabrication method of punching holes in the top plate and fastening rails with T-head bolts weakens the girder. With Morgan's method, stud welds are actually stronger than the parent metal.

Stud welding is still another example of the advanced design and construction features that make Morgan cranes the best in the business.

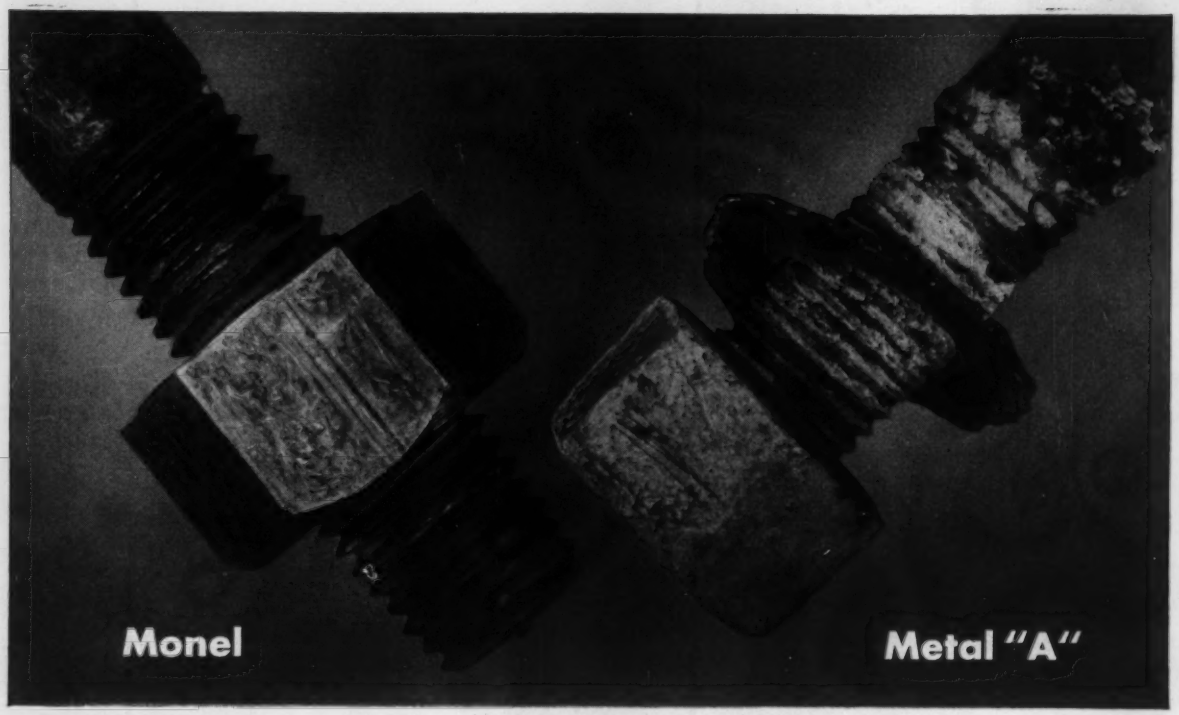
Performance records prove that Morgan cranes cost less to operate and maintain. Let our representative show you how to save the most by buying the best . . . Morgan!

By welding studs to cover plates, rails can be fastened to crane bridge without punching holes for T-head bolts . . . structural strength of the plate is protected. Static tension, torsion and impact tension tests prove the weld is stronger than the stud or parent metal.



THE MORGAN ENGINEERING CO. *Alliance, Ohio*

The Morgan Engineering Company, founded in 1868, manufactures overhead electric traveling cranes, gantry cranes, charging machines, plate mills, blooming mills, structural mills, shears, saws, and auxiliary equipment.



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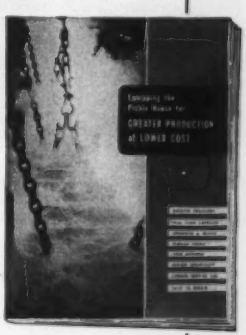

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Metalworking Outlook

Steelworker Demands

Here are the likely demands steelworkers will present when labor negotiations begin in late May or early June: A lay-off pay plan, a substantial pay raise, weekend premium pay, full union shop, improved vacations, more holidays, seniority revisions and more liberal hospitalization and medical-surgical benefits. Steelworker President David McDonald decries comments in the press that there will be labor troubles in steel this year. But any of those demands, particularly any of the first four, could bring difficulties.

U.S. Steel Expands

U.S. Steel Corp. plans to add 2.5 million tons of steelmaking capacity in the next three years. The program will include 1.5 million tons in the Chicago district, 380,000 tons at the Geneva plant in Utah, plus other projects. Inadequate depreciation allowances are the steel industry's No. 1 problem connected with expansion. Says Enders M. Voorhees, chairman of the corporation's finance committee: "We propose to press for more liberal depreciation in any honorable way we can."

Pennsylvania Leads

Of the 15 states that contributed to the increase of 2.5 million tons in steelmaking capacity last year, Pennsylvania contributed the most, 987,670 tons, giving that state a total capacity of more than 35 million tons. The American Iron & Steel Institute says Ohio, Indiana and Illinois continue to rank second, third and fourth in capacity. New York became the fifth largest steel state in 1956, with a capacity of more than 6.9 million tons, replacing Michigan which is now sixth, with 6.7 million tons of capacity.

Expansive Chemistry

An estimated $1.6 billion will be spent on new chemical construction in 1956 and 1957. The Manufacturing Chemists' Association says that privately financed chemical construction projects completed during 1955 totaled $772 million. Texas, California and Ohio rank in that order according to size of expansion projects completed or to be completed from 1955 through 1957.

Auto Parts: $3 Billion Worth

The automotive parts industry had sales of nearly $3 billion last year. Sales should go up steadily in the next ten, according to Sherrod E. Skinner, General Motors Corp. vice president in charge of accessory divisions. Looking toward 1966, Mr. Skinner predicts vehicle registration that year of 81 million, or 20 million more than today. "But it's mileage on the cars that means money to the replacement market," he says. "During the

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last ten years, average annual mileage has increased by 35 per cent—from 10,000 to 13,500 miles per car."

Ford's "E" Car

Ford Motor Co.'s new engine plant being built at Lima, O., will supply the power plant for the new "E" car to be introduced in late 1957. The model will be in the Pontiac-Dodge price and performance class. Although called the "E" car in this development stage, the vehicle definitely will not be termed the Edsel when it's officially named.

Large Uses in Small Ways

Large uses of steel in small ways continue to grow. Take hairpins and wire litter baskets. More than 12,500 tons of special wire will go into hair and bobby pins in 1956. The wire costs the 25 manufacturers an average $275 per ton. This year, about 20,000 tons of heavy gage wire and sheets will go into litter baskets. New York City is the best individual customer, and now has 25,000 wire units in service.

The Senate Investigates

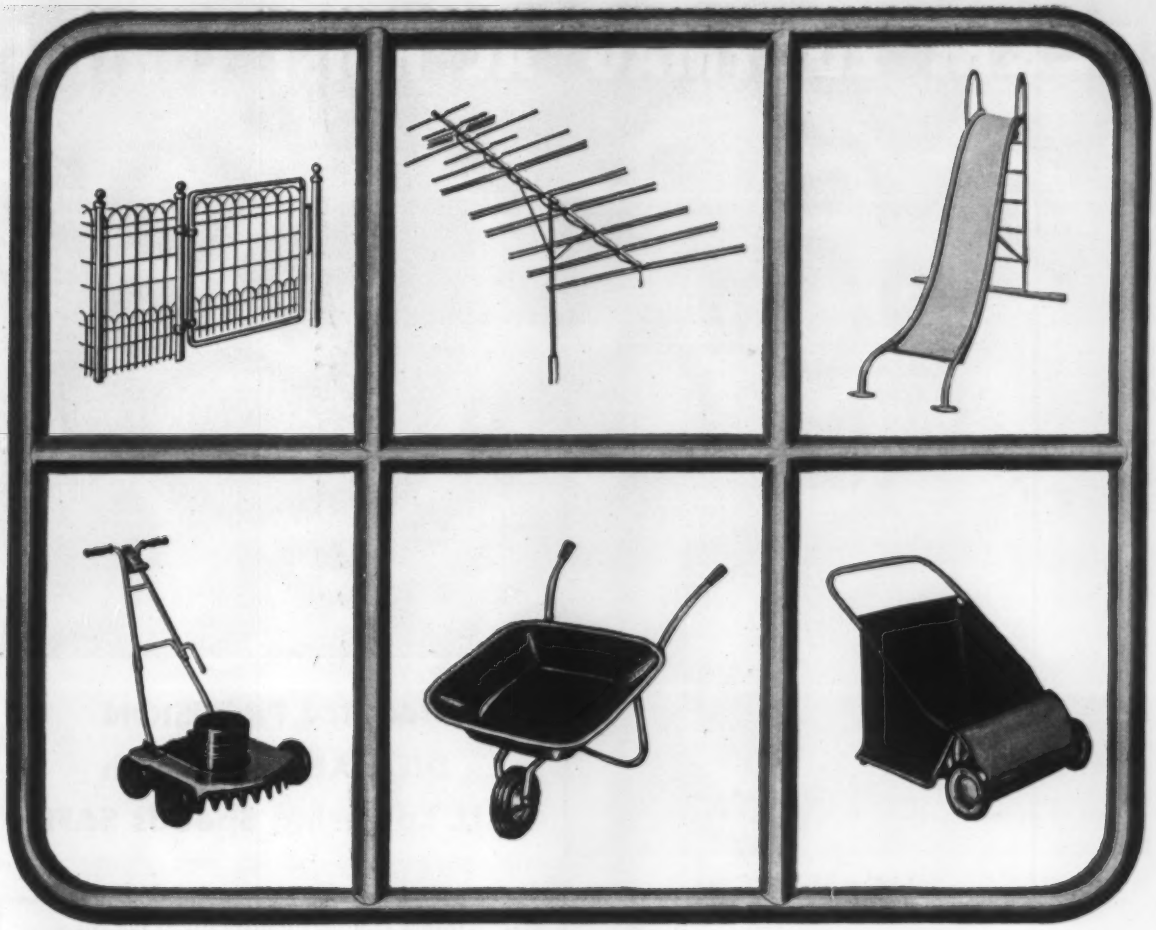
A Senate Small Business Subcommittee begins hearings tomorrow (Feb. 7) to check up on Defense department and Office of Defense Mobilization machine tool planning (STEEL, Jan. 16, page 39). That planning puts emphasis on modernization of current production facilities and de-emphasizes stockpiling. What's wanted is clarification of the policy, "to be sure we are now better prepared to meet any future emergency," says Sen. E. J. Thye (Rep., Minn.), subcommittee chairman.

Water, Water, Water

Look for the nation's daily water consumption to average 453 billion gallons by 1975, compared with 262 billion gallons now. The Commerce department predicts that industrial, military and commercial uses will climb from the present 60 billion gallons daily to 115 billion by 1975. Steam generation of electric power will boost the use of water from nearly 60 billion gallons daily now to 131 billion gallons by 1975.

Straws in the Wind

U.S. Steel will raise its lake iron ore prices before the start of the shipping season . . . The Senate subcommittee report on antitrust laws is scheduled for release Feb. 13 and will take a "cautious" approach . . . More than 2000 self-contained shopping centers are being built or planned . . . In a mechanization study, the post office is considering: Electronic devices that sort mail automatically; more special motor vehicles designed specifically to meet postal needs . . . Hanson-Van Winkle-Munning Co. has reduced prices up to 25 per cent on all its germanium rectifier models . . . Ford opposes a Michigan businessmen's group that seeks to get SUP ruled invalid in the state.



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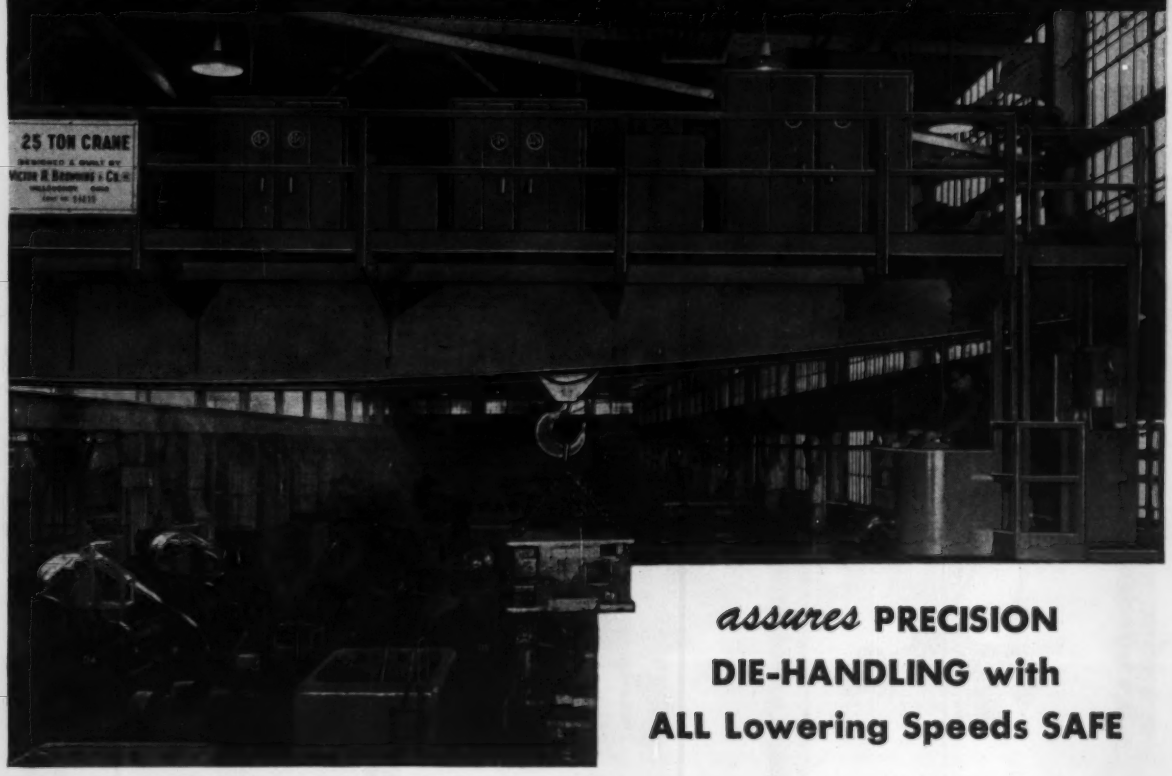

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What's Competition?

On Feb. 14 or soon thereafter the Department of Justice will seek to keep alive its 19-year-old antitrust suit against the Aluminum Co. of America.

The suit was brought against Alcoa in 1937 under the Sherman Act. During the course of ensuing court entanglements, the company was charged with a price squeeze, participation in an international cartel and monopoly.

In 1950, the court prescribed a five-year review of the competitive situation in aluminum, making this comment: If for any reason it should appear that competition with Alcoa is "feeble, uncertain and ineffective," appropriate action will be in order.

The court now wants a five-year extension of its review privileges on the basis of Alcoa's "superior" share of the market, its financial strength and presumably its weak competition.

Alcoa was the sole producer of primary aluminum in the U.S. almost from the day Charles Martin Hall emerged from his laboratory at Oberlin College with his new process in 1886 until the Reynolds Metals Co. entered the field in 1941.

During that half century Alcoa has had no easy time of it. There were the problems of finding ample supplies of bauxite, converting that bauxite into alumina and making available huge amounts of low-cost electric power needed to extract the metal.

Commercially pure aluminum, although light and corrosion resistant, is comparatively soft and of low strength. Strong alloys had to be developed through additions of other elements, such as copper, magnesium, manganese and silicon. Specialized fabricating techniques had to be worked out.

Aluminum, too, butted head on into competition with materials ranging from wood and plastics to zinc, copper and stainless steel. Today, the battle for markets rages with even greater intensity, with price, performance and appearance deciding the winners.

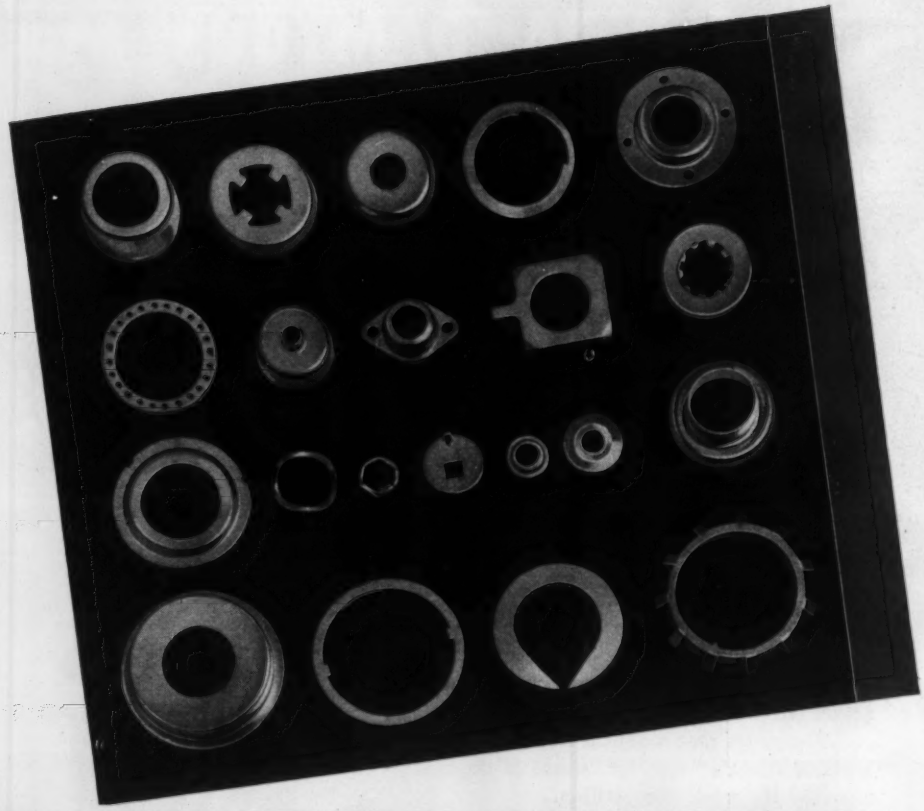
In its own industry, Alcoa's big competitors are Reynolds and Kaiser. Both are expanding with their own money. Strong newcomers are Anaconda, Harvey Machine and Olin Mathieson.

When present expansion programs are completed in 1957, Alcoa will have 33.6 per cent of the nation's 2.2 million tons of capacity, Kaiser 30 per cent and Reynolds 25.7.

If the Justice department doesn't think this is the setting for competition, what is?

Irwin H. Such

EDITOR-IN-CHIEF



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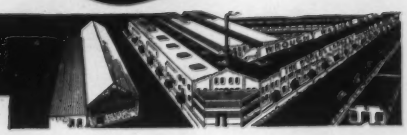
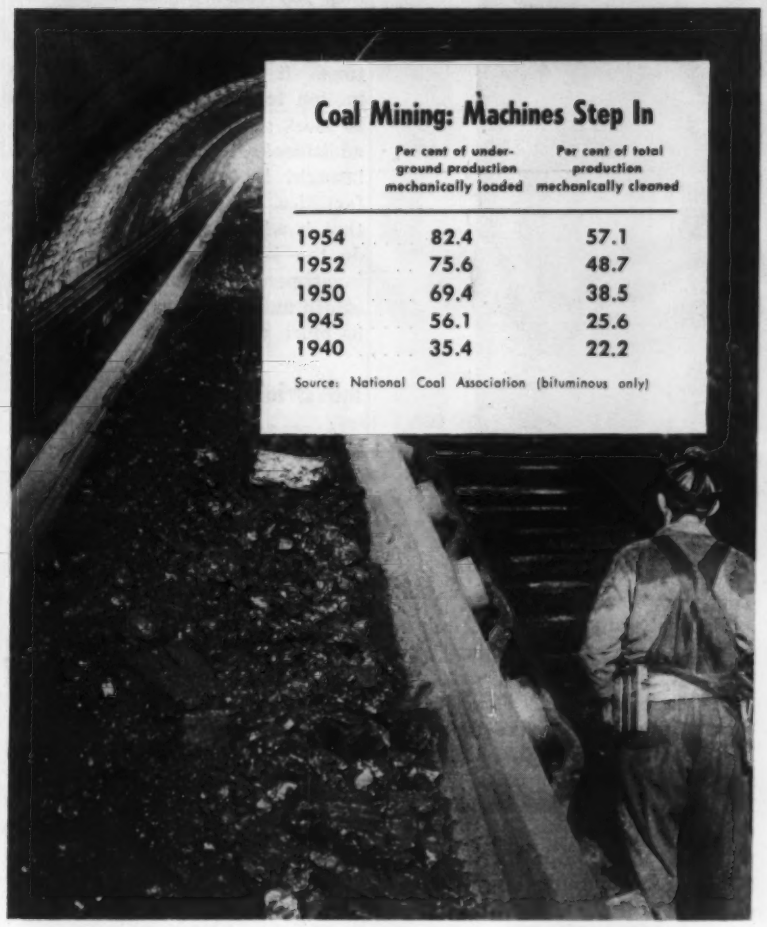




Coal Mining: Machines Step In

	Per cent of underground production mechanically loaded	Per cent of total production mechanically cleaned
1954	82.4	57.1
1952	75.6	48.7
1950	69.4	38.5
1945	56.1	25.6
1940	35.4	22.2

Source: National Coal Association (bituminous only)

Conveyor cuts cost at U. S. Steel's Robena mine

Coal Convalesces

Mechanization is doctor and cure for the coal mines. By 1960, output will hit 600 million tons; by 1975, 850 million. Growth means big markets for metalworking

THERE'S new life in coal. "By 1960, our industry will be producing 600 million tons a year," predicts Cyrus Eaton, chairman, West Kentucky Coal Co., Madison, Ky.

That's good news to coal men. It's equally encouraging for companies making coal mining, handling and processing equipment. Growth already is showing up in their order books. "Sales will be up 25 per cent this year from last," says one Chicago company. A typical Ohio manufacturer agrees, adding: "And 1955 was the best year we've had in quite a while."

Why?—If you remember that coal has seen an annual market of 250 million tons for railroads and home heating dwindle to less than 60 million tons in the last ten years, the prediction may sound overoptimistic. But it's being echoed throughout the coal industry.

Mechanization is the big answer. The last 15 years have seen terrific advances in the use of materials handling at mines (see table). The average soft coal miner produced less than 6 tons of coal a day in 1945. His new tools help him turn out more than 9 tons today. Since 1949, his wage has risen 75 per cent, but his product sells for the same price at the mine. Meanwhile, the cost of competing fuels has gone up fast.

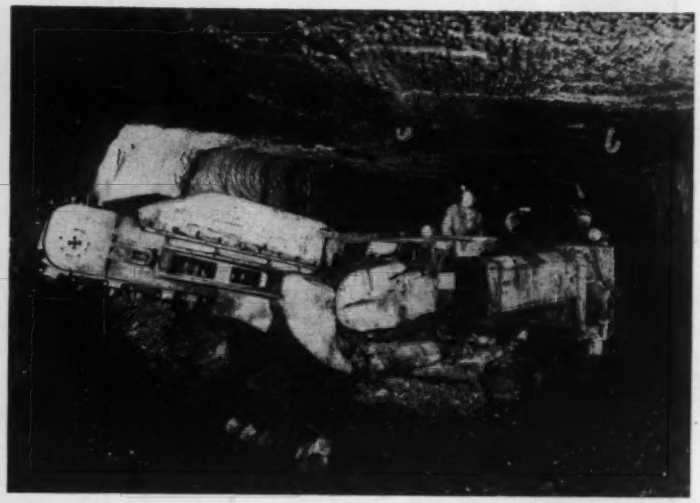
Predictions — The continuous miner will be one of the hottest equipment items in coal's bid to retain and improve this cost advantage. Though coal cutting has been highly mechanized since the 1930s, it's only in recent years that cutting and loading have been put together in one machine. Of 465 million tons of bituminous mined in 1955, only 25 million tons were cut by continuous miners.

There are some 400 mining machines in use today. It's estimated that by 1965, between 2500 and 3000 may be working (average cost is over $100,000 each). Some boosters believe they may eventually produce more than 75 per cent of all coal mined underground

Replacement—Says J. E. M. Wilson, vice president, sales, Jeffrey Mfg. Co., Columbus, O.: "With proper rebuilding, the average piece of underground equipment lasts ten years. However, machinery is improving so fast that it may be only five years before obsolescence sets in." Officials of Goodman Mfg. Co., Chicago, add: "A good continuous miner produces 8 tons a minute today. Within a few years, we expect output to hit close to 12 tons a minute."

Metalworking's stake in the coal mines goes deeper than the surface. A. T. Massey Co., Richmond, Va., recently opened a new mine, with reserves of 75 million tons of coal. The company's initial investment was $4.5 million, and the railroads added another $4 million for track and yards.

Breakdown—It took the services



Watch those teeth! A new automatic mining machine bites into the coal face. Pushbutton controlled giant is made by Joy Mfg. Co., Pittsburgh

of at least 32 metalworking companies to get the ball rolling. Some equipment needs: Carbide-tipped cutting tools; jacks; electrical motors, switches and controls; wire and cable; welding machinery; pumps and compressors; fans; belt and chain conveyors.

Above ground, too, metalworking's services are in demand. Says Allen & Garcia Co., Chicago engineer to the coal industry: "Mechanical washing and cleaning equipment is being boosted by demands for better coal from steel mills and from utilities. One preparation plant that we engineered recently cost $5 million. It's rated at 600 tons an hour. Plants must be individually designed for desired capacity and grade of coal."

Growth—A typical washing and screening plant involves 30 or more metalworking companies. To some extent, equipment overlaps that needed underground. But you also need screens, crushers, dryers, a furnace and dust collectors. At last count, 57 per cent of total coal production was mechanically cleaned. There's room for lots of growth. To reap full benefits of the continuous miner, you must follow through with automatic preparation, especially since the mechanical miner isn't choosy. It cuts and loads slate and shale just as readily as coal.

The coal equipment market takes in much more than mining and preparation. Coal transportation is an industry itself. And then there are companies like Fairfield Engineering Co., Marion, O., that serve the coal user. Says Julian H. Walker, vice president and general manager: "We're as much affected by the boom in coal as anyone. We're concentrating on the electric utility market. A typical job runs $500,000. This class of handling system is designed for 500 to 800 tons an hour."

Spark—Coal producers are betting heavily on the power generation market. Says George H. Love, president, Pittsburgh Consolidation Coal Co., Pittsburgh: "It will triple in the next twenty years." Last year saw plans drawn for aluminum producing plants in the Ohio valley based on coal power. Coal supplied some 135 million tons for power generation in 1955, compared with 72 million tons in 1945. Predictions for 1965 center on 225 million tons.

Coal is consolidating its facilities to meet the demand. Mergers are common in this industry of "small" and "large" producers. Bureau of Mines figures show that 3576 of the bituminous mines in operation in 1953 produced less than 10,000 net tons of coal each. In the same year, 226 mines produced over 500,000 tons each.

Adding Up—The mergers will help pay coal's expansion bill. By the early 1950s, soft coal capacity had fallen to some 500 million tons. It must be increased 100 million tons in the next ten years to meet anticipated needs, and an additional 100,000 tons must be brought in to replace worked-out facilities. The industry estimates that it will take 100 new mines to do the job. They will require an investment in machinery, real estate and engineers amounting to as much as $2 billion.

Industrial Prices Rise

Average prices for industrial materials went up 5 per cent in 1955, 4 per cent in the last half of the year. The Federal Reserve Board says early this year some commodities were 20 per cent or more higher than a year ago.

Also increased were prices of finished products. The board says they went up 3 per cent during the last six months of 1955.

The board attributes the price hikes to capacity operations in manufacturing and to stepped-up buying by consumers and business.

Also cited are rising wage rates in government and the auto, steel, transportation and service industries.

Home Modernization Packages

To offset any dip in new home starts this year, develop the home modernization market, advised K. E. Kamberg, executive vice president, Home Federal Savings & Loan Association, at the Home Builders' Show in Chicago. Home modernization promises to be a $10-billion industry in 1956.

Builders are able to offer home owners more custom styling at package prices with such metalworking products as door and window units, plumbing packages, stack-on appliances, complete kitchen units, combination heating and air conditioning plants. Major markets include new rooms and garages for the 7.5-million homes built since 1949; replacement of wornout plumbing, wiring and roofs of prewar homes; and apartment modernization.

U.S. Aluminum Ingot Capacity

(net tons)

	End of 1955	Being Built or Planned	Total
Aluminum Co. of America	706,500	86,000	792,500
Reynolds Metals Co.	414,500	145,500	560,000
Kaiser Aluminum & Chemical Corp.	428,200	226,300	654,500
Anaconda Co.	60,000		60,000
Harvey Machine Co.		54,000	54,000
Olin Mathieson Chemical Corp.		60,000	60,000
Total	1,609,200	571,800	2,181,000

All new Alcoa facilities will be completed during 1956. Except for the Listerhill project, all Reynolds capacity will be completed in 1956. All Kaiser expansion will be finished this year, except Ravenswood, tentatively scheduled for late 1957

New U.S. action against Alcoa questions . . .

Competition in Aluminum

IS ALCOA'S competition in the primary aluminum field "feeble, uncertain and ineffective?"

Department of Justice lawyers think it will take five more years to determine whether those adjectives apply, whether the two major competitors, Reynolds and Kaiser, have come of age.

Background—The matter comes up because the U. S. and Alcoa are about to skirmish again in an antitrust suit that had its genesis in 1937. In the course of the legal fireworks, the U. S. requested that Alcoa be divested of some of its facilities. That was denied by the court on the grounds that, in 1950, it was too early to determine how Reynolds and Kaiser would change the competitive picture.

In his 1950 decision, Federal Judge John C. Knox ruled: "If for any reason it should appear that their (Reynolds' and Kaiser's) competition with Alcoa is feeble, uncertain and ineffective, appropriate action . . . will be in order." He then prescribed a five-year period of court review of the competitive situation, which expired Jan. 16, 1956. The Justice department now wants court jurisdiction extended until Jan. 16, 1961, because the 1950-1955 years were "atypical." Hearings will be held by the U. S. District Court for the Southern District of New York on Feb. 14 or soon after.

Argument—In its motion, the Justice department says that Alcoa's share of the primary aluminum market "continues to be far superior to that of Reynolds and Kaiser." By 1957, when the three companies' current expansion projects will have been completed, Alcoa will have 36.3 per cent of the U. S. aluminum ingot capacity, Kaiser 30 per cent and Reynolds 25.7 per cent (see table). Alcoa's position is still superior, but is it "far superior?"

The Justice department complains that Alcoa's 1955 facilities "may be characterized as far superior to those of its competitors." Listen to the comments of competitors about their own plants: Reynolds: "From mining through reduction, we have a fully competitive operation." Kaiser: "We think our facilities are second to none."

The Justice department also charges: "Alcoa's financial strength continues to be of a high order of superiority and provides the means for future growth not generally available to its competitors." The latest net worth figures, for 1954, indicate Kaiser's was $108.7 million, Reynolds' $126.9 million and Alcoa's $454.8 million. Kaiser's net worth grew 165 per cent between 1950 and 1954, Reynolds' 92 per cent and Alcoa's 33 per cent.

Logic?—The government's motion contains this statement: "Alcoa, Reynolds and Kaiser have gone forward with specific plans for expansion, the natural consequence of which would be an even greater and more powerful industrial potential on the part of Alcoa which necessarily will work as a deterrent to new producers." The motion dismisses Anaconda's new capacity and the planned capacity for Harvey and Olin Mathieson as "diminutive."

Despite Reynolds and Kaiser's financial worth and expansion, Justice department lawyers evidently think they might backslide in the next five years because "experience based on the last five years is no solid foundation for judging the permanency of existing competitive conditions." They argue that the 1950-1955 period was not normal, but they say nothing about what is normal.

Congress' Opinion—Nor does the motion mention a congressional investigation of competition in aluminum. A Joint Committee on Defense Production submitted this report on Jan. 2, 1953: "Competition has been developing in the aluminum industry, and particularly since the end of World War II considerable progress has been made . . . It seems specially important for government to make certain that an oversimplified formula, such as the number of producers, should not be permitted to block or discourage the further growth of the industry."

Annual Earnings of Selected Steel Producers

	1955	1954	1953
U. S. Steel Corp.	$370,197,625	$195,236,672	$222,087,840
Bethlehem Steel Corp.	180,191,708	132,837,154	133,947,837
Republic Steel Corp.	86,271,491	52,875,164	56,743,547
Armco Steel Corp.	64,288,000	40,948,000	33,902,462
Inland Steel Co.	52,466,098	41,287,152	33,867,184
Jones & Laughlin Steel Corp.	50,104,000	25,032,000	31,015,000
National Steel Co.	48,289,453	30,334,871	49,174,080
Youngstown Sheet & Tube Co.	41,701,140	20,182,500	30,839,716
Wheeling Steel Corp.	17,296,000	9,595,740	12,458,311
Granite City Steel Co.	12,611,000	4,012,000	6,488,000
McLouth Steel Corp.	8,148,000	1,695,000	5,241,501
Pittsburgh Steel Co.	7,515,000	2,170,694	4,648,195
Lone Star Steel Co.	4,759,000	1,009,000*	2,113,568
Rotary Electric Steel Co.	3,772,074	1,849,810	2,262,367
Alan Wood Steel Co.	2,552,000	1,246,000	3,213,690
Copperweld Steel Co.	2,365,459	703,150	2,852,078

*Net loss

'55 Steel Earnings at Peak

WITH MOST of the results in for 1955, steelmakers are facing 1956 confidently. New records in earnings, sales, production and shipments were enjoyed by many firms last year; another 12 months like it may well be in the making.

Ingot Production — High earnings went hand in hand with new production records. Republic Steel Corp. bested its 1954 output by 2.7 million tons to hit a new high of 9,680,121 tons. Beating a 1953 record by almost 400,000 tons, Armco Steel Corp. produced 5,099,905 tons in 1955. Wheeling Steel Corp. set a record with 2,057,288 tons. Lone Star Steel Co. bettered 1954 production by 68 per cent.

Currently installing facilities to increase ingot capacity by 30 per cent, Granite City Steel Co. made 1,091,000 tons in 1955 to beat its 1953 high by about 150,000 tons. U. S. Steel Corp. produced 35.3 million tons, 500,000 tons under its 1953 high. It ran at 90.8 per cent of capacity.

Capacity Operations—Pittsburgh Steel Co. operated six percentage points above the industry's average rate, which was 93 per cent of capacity. Inland Steel Co. ran at 103.8 per cent of capacity to make 5,189,509 tons and better its 1954 record by more than 650,000 tons. Production of 5,571,556 tons at Youngstown Sheet & Tube Co. was 100.9 per cent of capacity.

Jones & Laughlin Steel Corp. ran at capacity to produce 6,190,000 tons, about 150,000 tons more than it made in 1953. Bethlehem Steel Corp. operated at 98.5 per cent of capacity; Republic at 97.1 per cent; and National Steel Corp. at 92.5 per cent. Lone Star operated near capacity; Wheeling Steel at 96.6 per cent.

Double Earnings — Of the ten largest steel producers, J & L, Youngstown Sheet & Tube and Wheeling Steel about doubled their earnings of 1954. Many smaller firms succeeded in doing this (see table). In almost all cases (National Steel is the major exception), steelmakers not only bettered 1954 earnings, but shattered records set in 1953 to make last year the best yet for the industry as a whole.

Year Ahead—As the year opened most producers were operating at or near capacity, a situation which will remain stable through the first six months at least. Few steelmen are willing to look farther ahead. Eugene G. Grace, Bethlehem's chairman, is among those taking the longer view. He says: "Personally, I am much more optimistic than some of the others that business will be good beyond the next six months. We're going to have good demand for steel all year."

U. S. Steel's chairman, Roger Blough, agrees: "The current quarter's production could be the best the industry has ever had and I am not at all pessimistic concerning the remainder of the year."

Republic Expands Four Plants

Ingot capacity will be increased 228,000 tons a year by the $22 million added to Republic Steel Corp.'s $130-million expansion program.

The enlarged program means 60,000 more tons of ingot capacity will be built at Chicago, 60,000 at Cleveland, 72,000 at Warren, O., and 36,000 at Gadsden, Ala.

All the expansions are expected to be completed by the end of 1957.

Bethlehem Expands

Ingot capacity will be boosted 3 million tons by a two-year, $300-million program

SPARROWS POINT, Md., is scheduled to become the site of the world's largest steel producing plant. Bethlehem Steel Co. will increase the capacity of its facilities there by 2 million tons. New total: 8.2 million tons.

About 500,000 tons will be added to capacity at both Lackawanna, N. Y., and Bethlehem, Pa., to boost capacity at Lackawanna to 6 million tons and at Bethlehem to 4 million.

Biggest Ever—Expansion this year and next will be the largest two-year program in the company's history. Because most of the expansion is being made at established plants, costs are only $100 per ton of ingot capacity. Work includes the rebuilding of open hearths, especially at Bethlehem.

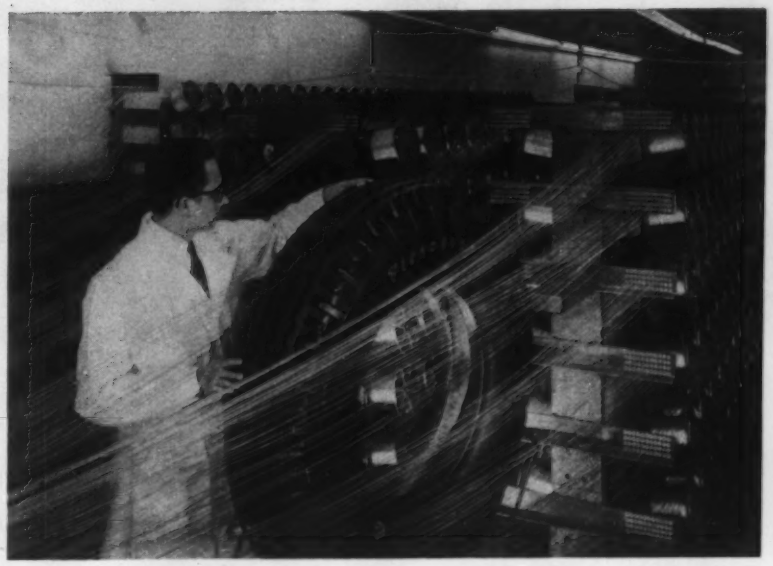
In addition to the $300 million for expansion, Chairman Eugene G. Grace says the company is spending about $100 million as its share in the development of Erie Mining Co.

Details—Mr. Grace said the Sparrows Point development includes a new blast furnace and seven additional 350-ton open hearths, a new roughing mill, a 45 by 90-in. slabbing mill, a new battery of coke ovens, additional soaking pits and steam and electric generating facilities. He thinks the new ingot capacity will be finished by August, 1957.

Expansion of the finishing capacity under way at Sparrows Point includes tin plate facilities which will add about 30,000 tons a month (probably by the end of next year) and a sheared plate mill which will start operations around October or November.

Mr. Grace said the shape mill program at Bethlehem will be finished by July. Capacity will be 210,000 tons a month.

Expense—Cost of the entire program includes $157 million authorized Dec. 31, 1955, and $125 million allotted since then. Authorization of another $18 million awaits engineering details.



Wire-protected tire is blowout-proof, says Firestone

Steel Cord Tires Weigh In

LAST MONTH, a national advertising program plugging steel cord tires was launched by U. S. Rubber Co., New York. The passenger car version will sell for 10 per cent less than U. S. Rubber's premium nylon grade.

Steel cord tires aren't new. Firestone Tire & Rubber Co., Akron, has been making them for years for truck and bus service. Raymond C. Firestone, executive vice president, claims steel gives them a life of up to 300,000 miles without retread, and that the half-million mile tire is not far away. But the possibility of a breakthrough into the consumer mass market would seem to open up new volume for steel cord producers.

Rebuttal—But Jones & Laughlin Steel Corp., Pittsburgh, hasn't yet had its line running for anything but trial lot production. American Steel & Wire Division of U. S. Steel Corp., Cleveland, is noncommittal about the potential.

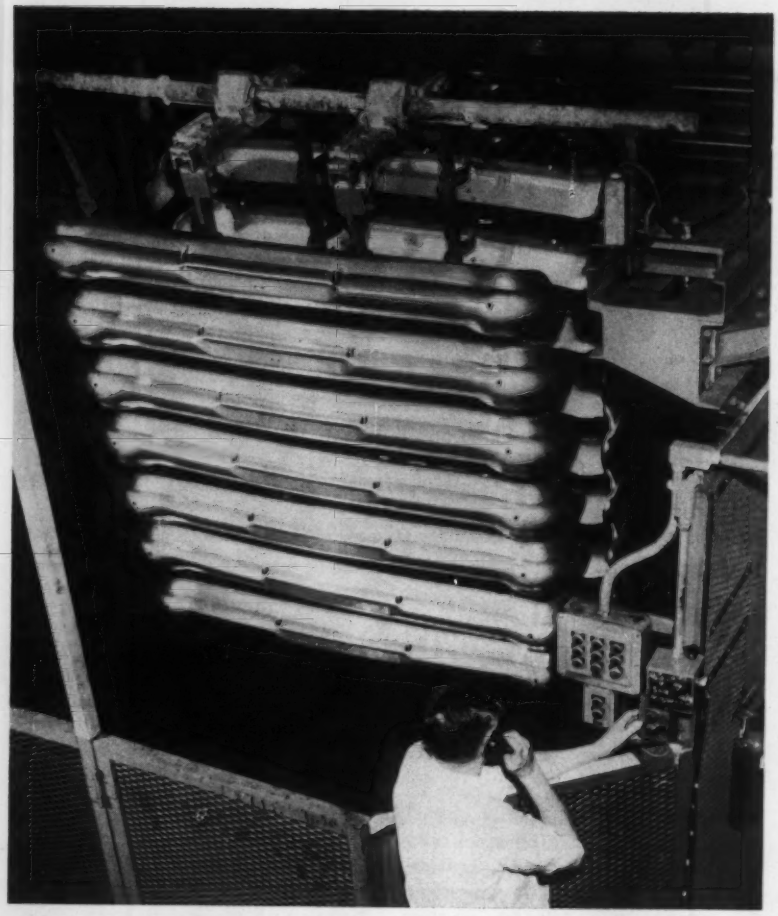
Explains Alfred H. Johnson, president, National Standard Co., Niles, Mich: "Belgian wire producers have geared their price to sell the cord here at the same figure it costs us to make the product. Tire wire cord cost contains a 90-per cent labor factor. U. S. producers with labor at $2.50 an hour can't compete on equal terms with 60-cent Belgian labor."

One reason why American steel companies are getting some of the business: Tire makers need the insurance of more than one supply source

Potential—It may take a breakthrough on the passenger tire market for much volume to develop for the domestic mills.

Even if steel companies could then solve their price problems, nobody knows how many motorists would pay premium prices for tires that could outlast their cars, almost certainly their ownership. Sold on the basis of safety, however, steel cord would fit well in the new trend of auto advertising. Market potential is attractive. Last year, over 110 million truck, bus and auto casings were built.

Whatever the future of the steel cord tire, there's a steady market for steel in tire beading. Last year, passenger car tires took close to 48,000 tons of carbon steel wire. Truck and bus tires accounted for an estimated 22,000 tons.



Olds bumpers get chroming (Equipment: Hanson-Van Winkle-Munning)

Plating Sales Hit High

ELECTROPLATERS face another shiny year. Many shops have sufficient contract work to assure peak production throughout 1956.

Plating equipment buying continues heavy. Hanson-Van Winkle-Munning Co., Matawan, N. J., points out that last year was the electroplating industry's best, both for purchases of equipment and supplies, and that 1956 looks even better for equipment sales.

Rationing—The nickel shortage is still hurting. Some electroplaters say they could use more than twice the amount available. Nickel is being allocated on the basis of purchases made during the last six months of 1949, or the first six months of 1950, whichever is to the advantage of the consumer.

Either alternative leaves much to be desired, say platers. One electroplating firm that used about 1000 lb of nickel a month during each of the base periods of 1949 and 1950, now receives only about 250 lb.

Gray Market—John Palik Jr., president, National Association of Metal Finishers, Cleveland, charges that these periods do not provide a proper base for allocations, since the industry was only operating at about 65 per cent of capacity. He also charges that the shortage of nickel has created a gray market, with metal going at as high as $3 and $4 a pound, compared with the generally accepted level of around 95 cents. (In December, 1954, platers were paying $1.25 a pound on the gray market.)

Certain areas appear to have been especially hard hit. Some Detroit platers have had to buy 75 per cent of their nickel at gray market prices. Some have had to cut operations by a third, because of lack of nickel at reasonable prices.

Help Wanted—Another industry problem is the increasing shortage of trained men. This is accentuated by growth of the industry.

It comprises some 6000 to 6500 capitive shops and 1600 to 2000 job shops, for a total of probably more than 8000. Recruiting is being intensified, with increasing attention directed to their training.

Techniques—Increase of automation is especially noteworthy. The trend is likely to continue at an accelerated pace in 1956, especially in electroplating operations for the automotive industry. Fully automatic equipment is available for anodizing. Manufacturers also are offering efficient rectifiers and generators with completely automatic control equipment.

Other significant developments: Better plating baths; increased plating speeds; and nickel processes which improve such physical characteristics as ductility. Use of aluminum as a base metal is gaining substantially. Suppliers are meeting this development with improved plating techniques and special buffing compounds.

Of particular significance is the development of the germanium rectifier. "This," one large supplier says, "is especially important because of the high efficiencies (90 per cent) and voltage control (within 5 per cent)."

Steel Plate Remains Tight

Short supplies of steel plates and wide flange beams will limit 1956 volume of plate fabrication. Little hope for more steel was given by David F. Austin, executive vice president - commercial, United States Steel Corp., when he addressed the Steel Plate Fabricators Association.

Mr. Austin forecast no decline

in steel consumption during the first half of 1956; any decline will be offset by rebuilding inventories to comfortable working levels. Little of the new steel capacity will be available before 1957 at the earliest and heavy industries expect to increase consumption this year.

H. D. Skyrm, vice president, General American Transportation Corp., Chicago, is president (re-elected) of the association. Other officers are: E. E. Michaels, vice president and manager of operations, Chicago Bridge & Iron Co., vice president (re-elected); Otto H. Lange, executive vice president and treasurer, Hibben & Co., Chicago, treasurer, (succeeding William S. Wheeler, Pennsylvania Engineering Corp., New Castle, Pa., who left the association post after 14 years); and J. Dwight Evans, Chicago, executive director and secretary (re-elected).

Canadians Build Pipe Mill

A $10-million mill to produce electric-weld pipe is being built at Welland, Ont. The project is a joint enterprise of Page-Hersey Tubes Ltd., Toronto, Ont. and Steel Co. of Canada Ltd., Hamilton, Ont.

The mill is expected to be in operation by the end of the year. It will make pipe from 20 to 36 in. OD. Capacity of the mill will be 200,000 tons of steel pipe a year.

Buildings of the new operation (proposed name: Welland Tubes Ltd.) will cover more than five acres near Page-Hersey's present pipe mills at Welland.

More Steel Containers

Steel shipping container production will be up in 1956, says Livingston Keplinger, president, Steel Shipping Container Institute Inc. The increase will be greatest in barrels and drums fabricated from sheet steel (19 gage and lighter) and in pails and kegs (18 gage and heavier). The rate of increase of heavier-gage barrels is under that of the lighter gage, because more heavier-gage containers are reconditioned.

Lighter drum production in 1956 is estimated at 9.5 million units, compared with 8.9 million in 1955. Pails and kegs may reach the 80-million mark.

Engineer Shortage Symptomatic

The shortage of engineers and scientists in the U. S. is "symptomatic of a growing shortage of adequate manpower in other fields," says Roger M. Blough, chairman, U. S. Steel Corp.

Caused primarily by the unprecedented growth of our economy, Mr. Blough lists three ways to produce the needed engineers. 1. Increase financial reward. 2. Relieve engineers of routine work. 3. Attract young persons on the basis of the "spiritual" reward.

Use Studs as Shear Connectors

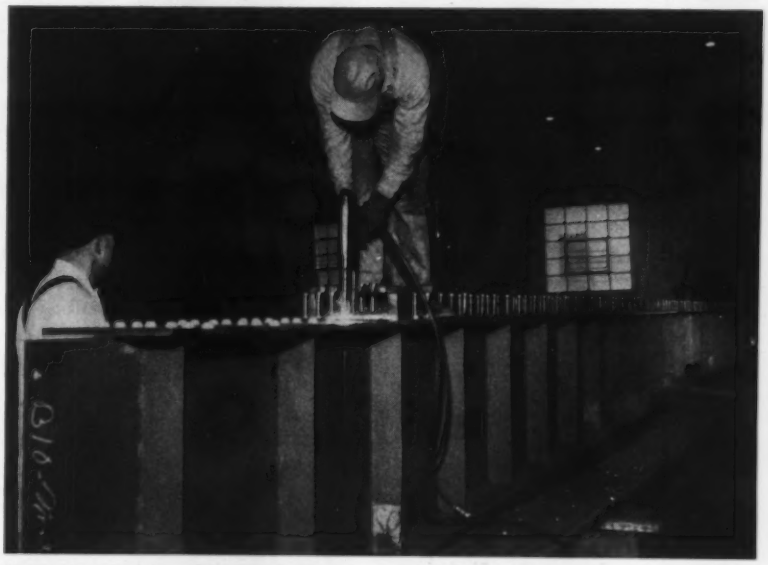
SUBSTITUTING end-welded studs for angles as shear connectors assures the interaction between concrete slab and steel beams in composite buildings and bridges.

So says K. R. Scurr, bridge engineer of the South Dakota Department of Highways, and designer of a composite bridge over the Bad river at Ft. Pierre. Nelson granular flux-filled studs are manufactured by Nelson Stud Welding Division, Gregory Industries Inc., Lorain, O. This new application of studs is being used on other bridges under construction in South Dakota, Georgia, California and New Jersey.

Saves Time—One structural fabricator, Egger-Scudder Co. of Sioux Falls, S. Dak., reports stud shear connectors can be end welded to the flanges of girders about four times faster than by other means. Shop time is reduced by eliminating preliminary tack welding, shearing, grinding and other machining. Because of the equipment's portability, the method is also suitable for field installation.

Mr. Scurr explains that distortion and warping caused by hand welding other types of shear connectors to bridge girders is "absolutely eliminated" with studs.

Other Uses — In addition to bridge work, Nelson stud shear connectors have been used in the structural framework of International Business Machines Corp.'s new research laboratory at Poughkeepsie, N. Y.



Egger-Scudder Co., Sioux Falls, S. Dak., structural fabricator, saved shop time when end-welded studs were used as shear connectors on a composite bridge

Business can reinstate some fast tax write-off applications as...

ODM Repeals Its 60-day Rule

THE OFFICE of Defense Mobilization is giving a second chance to 246 applicants for fast tax write-offs.

Those firms were left out on a limb Aug. 11 when ODM closed or suspended 21 expansion goals and put into effect a "60-day rule," turning down applications filed less than 60 days before the cut-off date. Under the new ruling, those requests will be reconsidered if the applicants ask for it.

Metalworking—Expansion goals affected: Airport facilities, bauxite, by-product coke, cryolite, electrolytic tin plate, gas pipelines, grain oriented steel sheets, inland waterway terminals and vessels, iron ore, diesel locomotives; debarking and chipping facilities for lumber and wood products, motor truck terminal and repair facilities, natural gas liquids, petroleum pipelines and storage, rail passenger cars, railroad terminal and road facilities, special manufacturing facilities for metal cans, titanium, warehousing and storage facilities.

ODM admits it made a boo-boo when the closing of the goals was, in effect, made retroactive. The thought at that time was to cut out "opportunists" who filed just before the deadline to get a certificate in case it might someday come in handy.

Motives—Besides squawks from those frozen out by the 60-day rule, another reason for the reinstatement, it's thought, is that additional capacity is sorely needed in some of the categories affected and that ODM is hoping some of it will be installed if the certificates are granted.

It's pretty well conceded, though, that fast tax amortization wasn't nearly so effective a spur to expansion as was hoped. New incentives are being looked for. Especially wanted is more capacity in nickel, copper, aluminum and long lead-time components like boilers, bearings, valves.

ODM Issues Write-Offs

The Office of Defense Mobilization has granted accelerated tax amortization for 31 facilities totaling over $91 million in the latest two weeks period.

About $28.5 million is for the purchase of railroad freight cars. Two certificates for fast tax write-off issued to the Southern Railway totaled $13,915,000.

Over $53 million is for electric power generating and transmission facilities.

Pentagon Parade

Defense spending, expected to increase to $35.5 billion in fiscal 1957, will continue to go up, predicts Air Force Secretary Donald A. Quarles. Highly complex weapons and the development of the specialized technical know-how to produce them are pushing up the costs.

Legislation is in the works to extend for two years the authority of the armed forces to maintain stand-by production capacity in both government-owned and private plants.

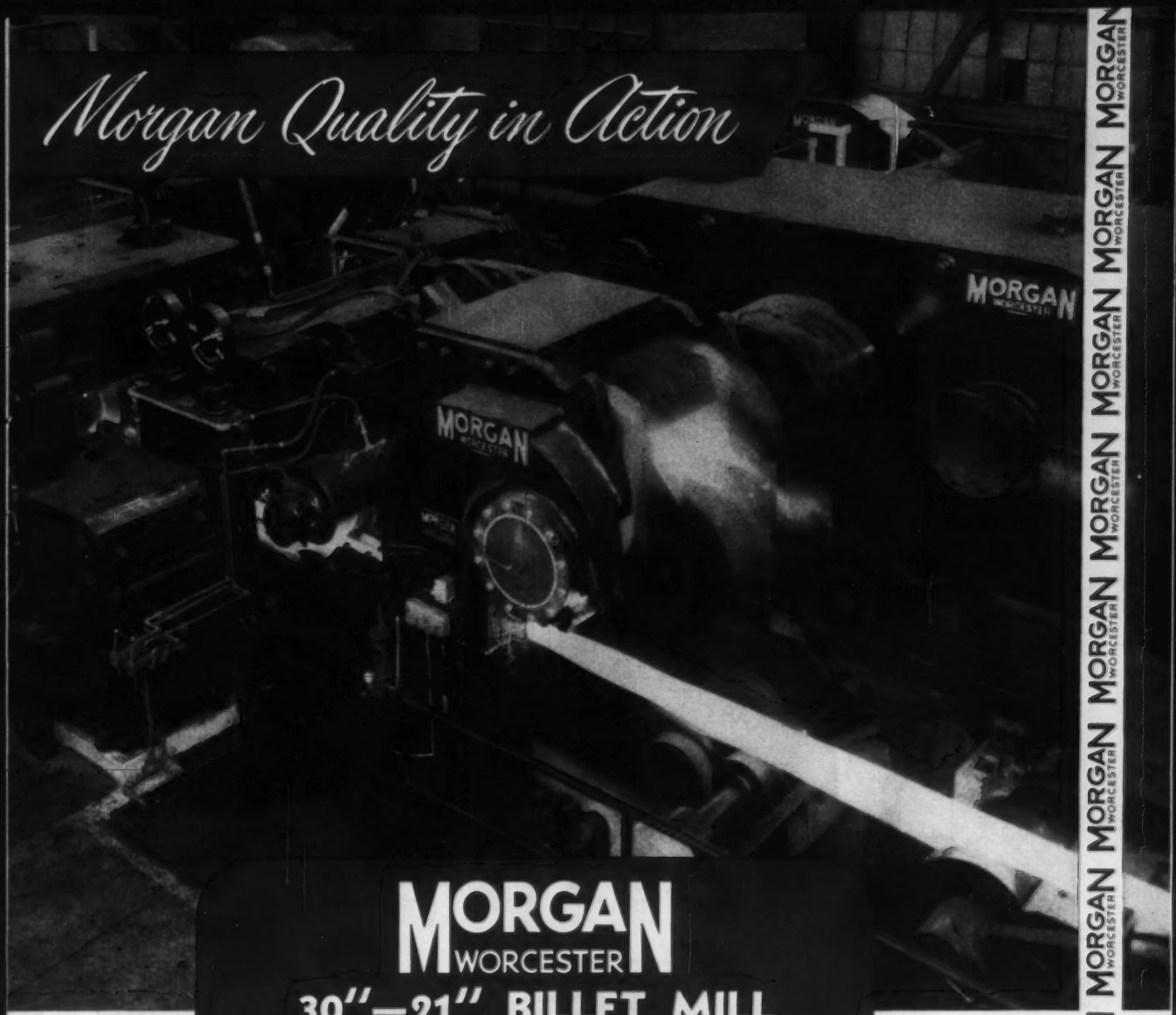
As the Air Force replaces its piston-engined B-36 heavy bombers with the jet B-52, the retired B-36s will be dismantled and used as a source of spare parts for those remaining in service. Hopes are that it will make for economy by eliminating production of spare parts, which in the past continued long after production of complete planes had ended.

To get a better return on surplus materials sales, the Army has eight civilian experts trying to better the situation.

Here and There

It's a good bet that firms wanting to merge will find the going tougher before the year is out . . . President Eisenhower's request that Congress look into stand-by controls on consumer credit didn't generate much enthusiasm . . . Not everybody is happy with the channeling of government contracts into distressed areas. Sen. Strom Thurmond (Dem., S. C.) has introduced a bill to reduce such activity now done under auspices of several Office of Defense Mobilization orders . . . Talk of no tax cuts this year is increasing. Feeling is that unless the economy needs souping up in the middle of the year, neither party will want to be held responsible for upsetting the budget's precarious balance . . . The President has his own investigation of the Nicaro expansion deal under way . . . Highway users can look for higher taxes along with better roads next year.

Morgan Quality in Action



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Every Morgan Mill is developed by highly skilled technical engineers to answer the exacting demands of mass production. Morgan introduced the first successful continuous rolling mill in this country—and has consistently maintained leadership in producing quality, high production mills in this country and abroad.

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You can draw
— form THIS...

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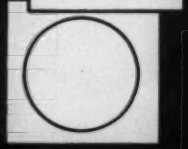

with simple, inexpensive
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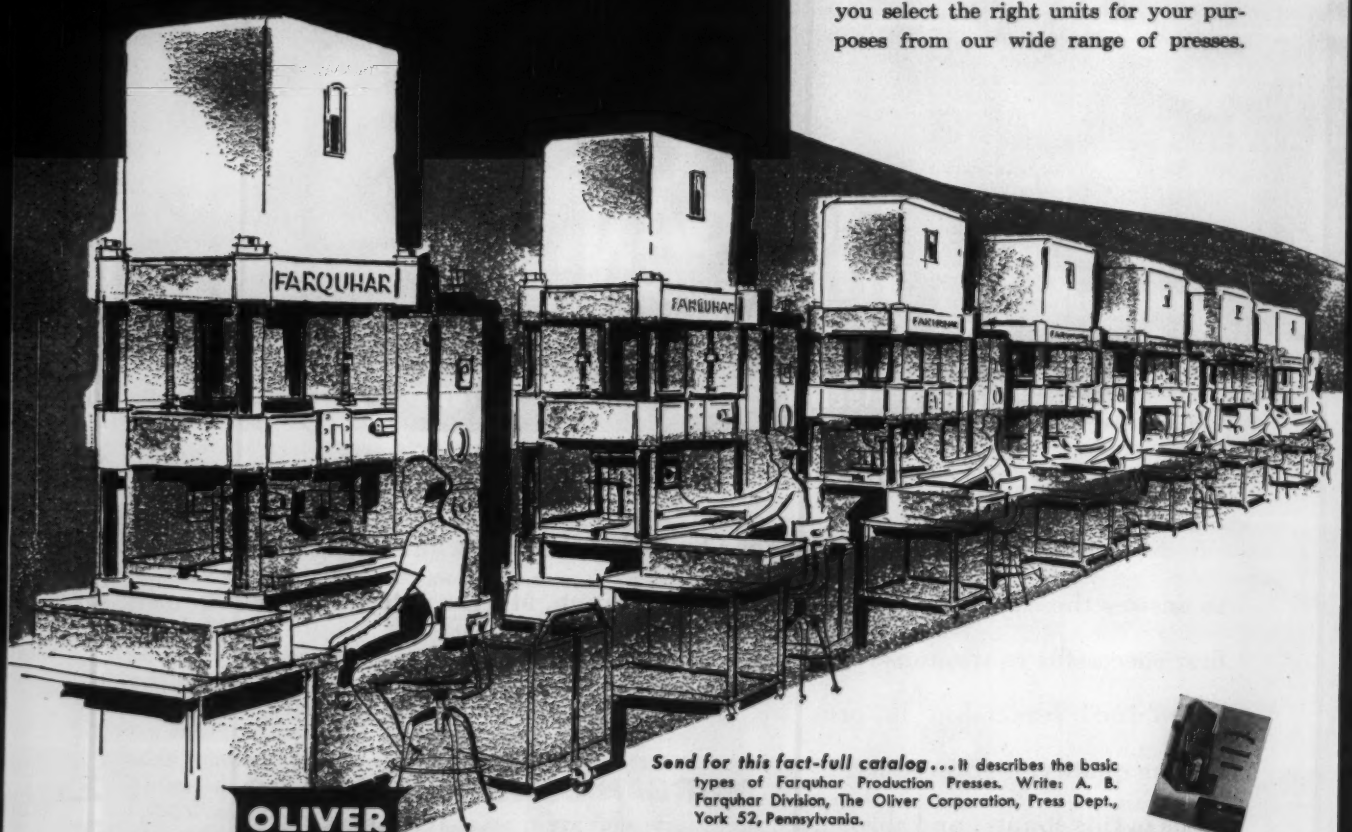
THE economies of automation and constant-flow set-ups need not be dependent on high cost dies. The versatility of Farquhar Production Line Hydraulic Presses makes it possible to draw and form intricate shapes by progressive operations using simple, low cost die-sets.

The economy of these presses is not confined to reduction of tooling cost. For instance, the four column presses illustrated here provide areas for loading and unloading from four directions providing maximum flexibility in setting up a constant flow of material in a production line operation.

Maintenance costs, too, are minimized by sound engineering and construction. Easy accessibility to all moving parts is an important maintenance feature.

Farquhar engineers are ready to help you select the right units for your purposes from our wide range of presses.



Send for this fact-full catalog... it describes the basic types of Farquhar Production Presses. Write: A. B. Farquhar Division, The Oliver Corporation, Press Dept., York 52, Pennsylvania.

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PRODUCTION PRESSES

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C. R. Kubik: Director with Five Shows

DIRECTING a hit show may be a complex job, but the complexity sky-rockets when a director has five shows on the road at the same time.

That's the job which keeps Clare R. Kubik busy. As executive vice president of Motch & Merryweather Machinery Co., Cleveland, he's co-ordinator of five divisons that sell: 1. Machine tools for which M & M is a distributor. 2. Machine tools this company builds. 3. and 4. Cutting tools distributed by and those manufactured by his company. 5. Used machine tools. Each sales activity has a separate staff "because often a different man does the buying and different selling techniques must be used."

Working on Return—Golden hours for selling run from about 9 to 4. Allowing an hour for lunch, that makes it a 6-hour day. His biggest concern is to get the maximum return per hour—more calls per day.

Any job or detail, he says, that takes a man away from his customers during the too-short day is a costly one. "We've got to keep our men in the field, prevent their spending time as clerks."

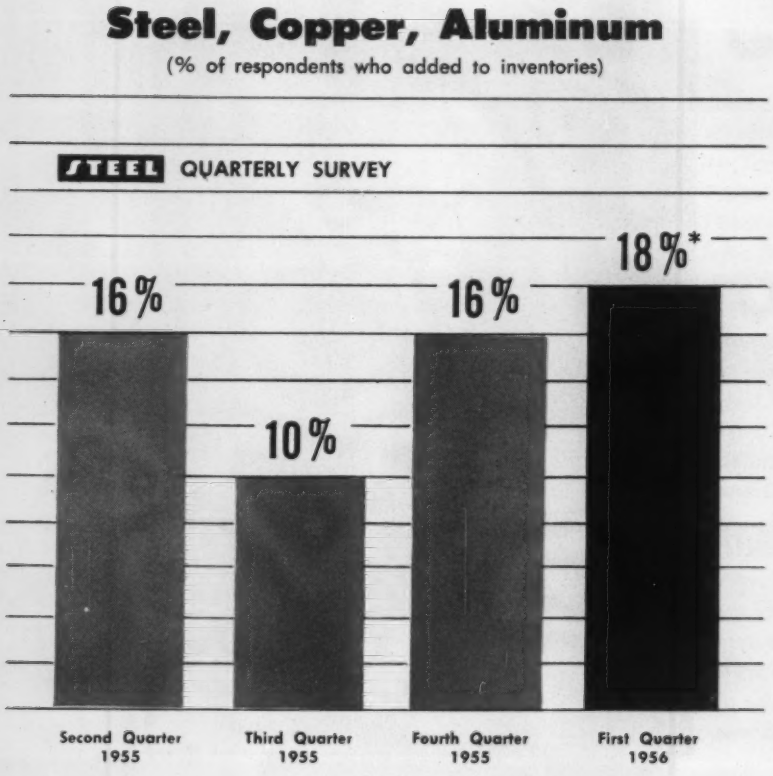
His approach: Set up an inside organization that will handle all sales duties except the call. It amounts to building a company-wide sales team. He feels it's essential that salesmen report each call, tell who they talked to and what happened. With few exceptions, that's all.

Expediters — Other paper work is handled from the home or district office. A highly organized staff has been set up to get quotations to the customers in jig time. It also expedites routine correspondence and takes care of customer service and order follow-through.

Another must: A good direct mail and advertising program that can sell to the customer when the salesman isn't there.

He's sure his system is paying dividends. With better support, his field men have more time for missionary calls, are doing a better job of covering the territories.

Well acquainted with the problems of selling, Mr. Kubik has spent most of his 25 years with M & M as a salesman. Off the job he's an amateur athlete and dabbler in the arts. His old favorite, tennis, is being replaced with a rabid interest in golf. He likes music, can get a tune out of both the guitar and piano. He also is "strictly an amateur" oil painter—finds it both absorbing and relaxing.



Survey includes: Steel products (bars, strip, sheet, plate, structural shapes, wire, tubing), pig iron, copper and brass mill products, copper wire and cable and aluminum products
*Estimated

Buyers Play It Safe

SOME 18 PER CENT of steel, copper and aluminum users responding to STEEL's latest inventory and delivery survey expect to have higher inventories three months from now.

Last quarter, and for the first time in a year, the number of metal users who built up inventories (16 per cent) exceeded the number (12 per cent) who told STEEL that they planned to do so (Nov. 7, 1955, page 99).

Guarding—Management's thinking behind expanding inventories is expressed by three purchasing agents in the East and Midwest. A New York tool and die executive reports: "We are keeping and replenishing regularly a larger-than-necessary inventory to guard against possible shortages." In Illinois a PA says: "Inventories of cold-rolled sheets and strip are higher than normally desired." Another midwestern PA plans to "stay in a safe position for at least another six months."

Shortages — Structurals, sheets and plates and aluminum products continue to be short. Two out of three structural shape users are unhappy with deliveries; so are one of four sheet users and half the plate users.

"It has been nip and tuck on steel sheets for four to six months," says an Iowa PA.

Deliveries in general are only slightly improved. The percentage of respondents having trouble dropped from 50 to 40 per cent.

Aluminum—Better than 30 per cent of aluminum users are having trouble on deliveries. One-third have inventories in the 10-30 day class; 42 per cent have a 30-60 day supply. The situation is the same as three months ago.

A production superintendent in Denver, besides finding steel "harder to obtain than at any time since 1946," reports: "Aluminum products are out of the question for the small manufacturer."

Demand Continues — A Jersey PA is one of the 32 per cent who expect inventories to be lower in the next three months. Of this group only 14 per cent think lower inventories will better their position. The Jersey PA says his firm would work more than 40 hours a week "if carbon steel were more available."

Inventory levels generally remain similar to STEEL's last report. About 60 per cent of respondents have inventories in the 10-30 and 30-60 day categories.

A Richmond, Va., PA notes that, although the present season is "usually slack" and inventories have a tendency to build up, it is "not so" this year.

Allocations—The feeling toward industry allocations is mixed. A Cleveland PA wants government allocations in the months to come, because "military needs" will take an increased amount of steel. A New Yorker claims: "Allocations of sheet and plate are entirely inadequate."

Spotty—The national picture is spotty. Where one PA reports "mill deliveries impossible to obtain," another from the same area says: "Our steel sheets are arriving ahead of schedule from one mill." Conclusion: Metal users will try to build stocks in the next three months.

AEC Licenses Readied

The Atomic Energy Commission's regulation for licensing facilities, such as nuclear reactors, isotope separation plants and plants for processing irradiated materials containing special nuclear material, becomes effective Feb. 18.

A major concern of the regulation is public health and safety. In addition to precautions to protect the public, the applicant for a license must furnish information on his ability to pay AEC charges for nuclear materials and carry out the proposed use.

Popularity of stock purchase plans mounts as more . . .

Employees Become Owners

WHEN FORD MOTOR CO. offered to settle its labor negotiations by offering company stock to employees at half price last summer, the union indignantly refused the proposal.

Public acceptance of Ford stock indicates that the union's answer might have been approval if the matter had been put to a vote of the membership.

Popular—Stock purchase plans have been immensely popular since the end of World War II. Why?

In some companies there has been pressure by employees—particularly in the salary and management groups. In periods like this post war era of rising stock values, the advantages to employees who can get stock below the market price are obvious.

A more common view among companies which have stock programs is that they help foster better management - employee relations.

In Favor—Says Joseph L. Block, president, Inland Steel Co., Chicago: "Stock purchase programs should create a better understanding of our economic system; they should produce greater employee loyalty and incentive; and above all, if launched on a widespread scale throughout the country, they should be a strong force in helping to preserve our private enterprise system."

Inland's record indicates employee endorsement: When a new program was announced last July, over 47 per cent of eligible employees signed up.

Check List — In planning your program, consider:

Who will be eligible to participate? Under Inland's program any employee with two or more years of continuous service is. Some companies, like International Harvester Co., Chicago, exclude directors. The seniority requirement is aimed at eliminating employees in the high-turnover group.

What subscription should be allowed per employee? Most firms use a percentage of annual salary as the basis—twenty to 30 per cent is the usual range. Some companies, like American Brake Shoe Co., New York, set the maximum at the individual's annual salary. If stock is oversubscribed, shares are prorated.

Where will the stock come from? Most plans are set up for a limited time and use unissued or reacquired treasury stock.

Payment?—Plans are generally considered an employee service or benefit program. A common feature is to permit employees to sign for an "option to buy" rather than purchase outright.

Payment is generally by payroll deduction, with provision for cash payment. The option is for the protection of the employee and provides a savings-with-interest feature.

A Plan — Inland has a three-year, option-to-buy plan. The price is fixed at 10 per cent below the market price at the time the employee signs the option. At the end of the first year, the employee can exercise part or all of his option. Or he can wait three years and either take the stock or the cash accumulated through payroll deductions, plus 2 per cent interest.

If the employee exercises part or all of his option before the three-year period is up, he gets immediate ownership of the stock and participates in any dividends.

Another Plan—Rheem Mfg. Co., New York, has another type program which is more of a "service." Employees with the company four or more months may participate. The employee contributes up to 25 per cent of his monthly salary into the stock purchase fund. Each month the fund administrator takes the accumulated money and buys stock on the open market.

Any dividends go into the fund, and once a year the stock is issued to the employee according to his contribution. There is no option - with - cash - withdrawal provision.

Cost—Getting stock out for public offering costs roughly 5 per cent the total value. If you give your employees a 10 per cent cost advantage, it's only costing you about 5 per cent. Many feel that gains in incentive and management-employee relations factors outweigh the extra cost.

A word of caution: One of the chief reasons for the option feature and time limit is for employee protection. Stock purchase plans were gaining favor in the late 1920s. When the stock market crash came, many employees not only lost their jobs but a form of savings that had originated within the company. It cost many firms badly needed funds to heal the wounds by buying back the stock.

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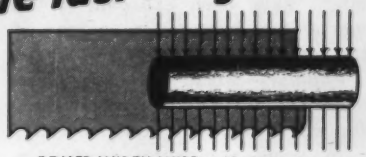
Look for ... ask for the blade with the "RED END"

Test after test proves that Simonds "Red End" Hack Saw Blades last uniformly longer. One reason is Simonds *cross-rolled steel* . . . steel that has a more uniform grain structure for added toughness.

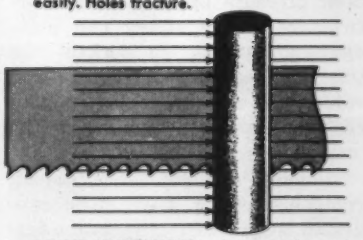
Another reason is Simonds own high quality steel — made especially for hack saw blade use.

Add to this Simonds improved method of tooth setting . . . and Simonds more uniform heat treating . . . and you've got the reasons why Simonds "Red End" Hack Saw Blades last longer, give more cuts per blade, cost less to operate.

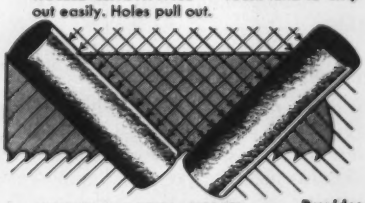
Furnished in all standard lengths and tooth sizes for hand and power use with a choice of High Speed MOLYBDENUM; High Speed TUNGSTEN; WELD-EDGE (High Speed Shatterproof); and STANDARD STEEL (Hand Blades only).



ROLLED WIDTH-WISE — Blade tends to snap easily. Holes fracture.



ROLLED LENGTHWISE — Teeth tend to strip out easily. Holes pull out.



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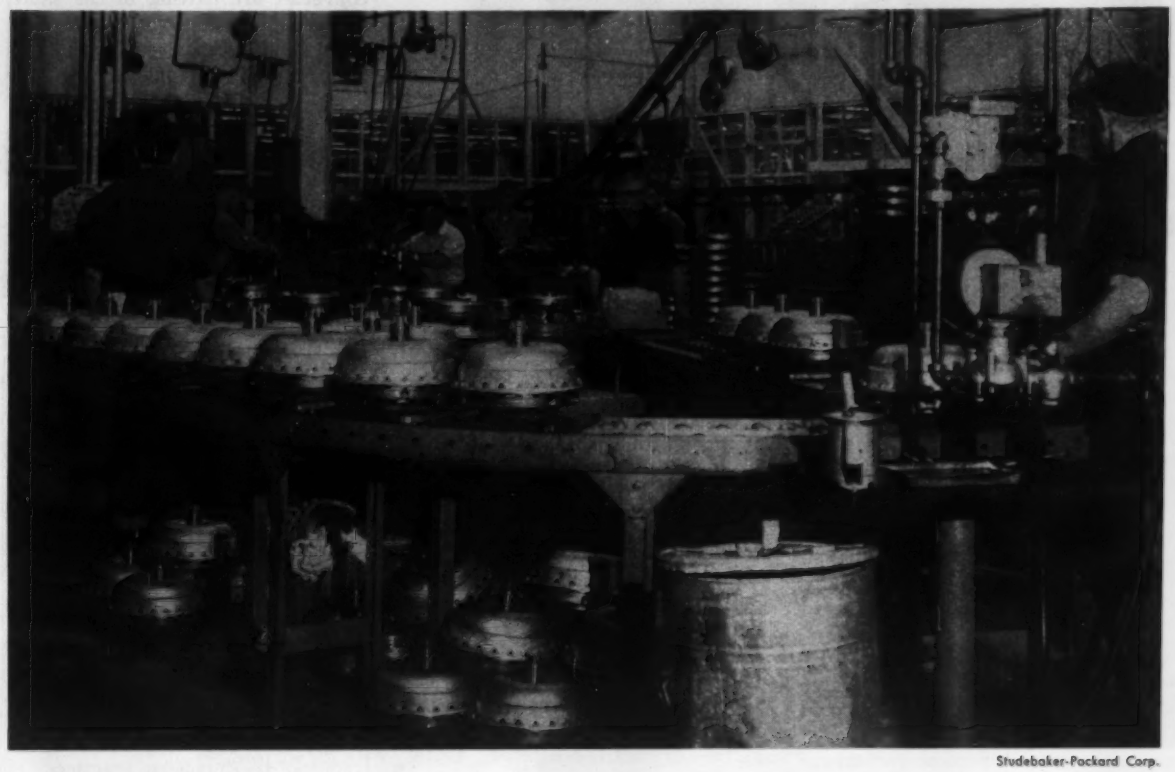

Studebaker-Packard Corp.

More and more shiftless transmissions roll off the lines as . . .

The Automatics Gain

AUTOMATIC transmissions still are in a state of flux, says Forest McFarland, chief engineer, advanced engineering, Studebaker-Packard Corp., Detroit.

This doesn't mean the automatic transmission won't last. Quite the contrary. "We must always have some type of transmission no matter where we move in automotive power development," Mr. McFarland asserts, "even though the gas turbine, when and if it comes, contains its own torque converter."

More Automatics—The trend is definitely toward the automatic type. Chrysler Corp. reports that about 90 per cent of its 1956 models are being ordered with Powerflite transmissions. Mr. McFarland believes, however, that standard shift transmissions will continue in use for some time, particularly on lower-priced cars built for export.

In discussing the history and future of automatic transmissions, Mr. McFarland told the Buffalo section of the Society of Automotive Engineers that ideas for automatic transmissions began to appear even before automobiles were generally considered a practical means of transportation.

History—Thomas L. and Thomas J. Sturtevant, Newton Center, Mass., filed a patent application in 1901 for a motor vehicle with a centrifugal clutch. Later transmission designs fell into the following types: Inertia, variable crank, hydrostatic, pneumatic, electric and friction.

These devices proved unsuccessful because of poor efficiency, cost and weight problems. They gave way to two basic types in use today—stepped gear and torque converter designs.

Stepped Gear—The best example of today's stepped gear transmission is Oldsmobile's Hydramatic drive which first appeared on the 1940 model—earlier designs were introduced by Oldsmobile in 1937 and Buick in 1938. The Model T Ford transmission was a stepped gear unit which was operated mechanically rather than hydraulically.

The hydraulically operated stepped gear type changed little until this year when Oldsmobile replaced the front friction band in the first planetary gear unit with a small hydraulic coupling and substituted sprague clutches for the friction clutches. Offered on Cadillac and Pontiac as well, these units have it over earlier Hydramatics: Engagement in the planetary gear changes between two of

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The Packard Predictor

Incorporating such features as rear end transmission, independent rear wheel suspension and pushbutton controls, the Predictor has a 122-in. wheelbase. Its basic body style may hint strongly at what the 1957 Clipper will look like

the three gear shifts is smoother.

Torque Converters—"This type design until recently has not quite had the performance equal to stepped gear units, but the torque converter has been smoother," says Mr. McFarland. "It eliminates almost all the shifting required in the stepped gear design."

Although an automotive torque converter was developed in Sweden in 1928, this transmission didn't appear in quantity production until Buick brought out its Dynaflow in 1948. It was followed by Packard with its Ultramatic in 1949, the Borg-Warner transmission in the Studebaker and Chevrolet's Powerglide in 1950. Ford produced its model in 1951 and Chrysler followed in 1953.

Comparison—Pointing out some operational differences between the two transmissions, Mr. McFarland says: "Original stepped gear design gave maximum performance and good economy, but at the expense of steps and shifts during acceleration. It also is a more complicated design. Although gains in smoothness have been made, it still is necessary to further improve smoothness, simplify construction and reduce manufacturing costs.

"The original torque converters offered a maximum of smoothness with lessened performance and economy. Here, too, gains have been made, but further development promises even better performance and greater economy."

Economy—It takes a lot of gas to bring cars up to speed in overcoming inertia. Just how much depends in large measure on the driver's habits. For that reason, direct economy comparisons may not agree with one individual's experience. Despite slippage in the fluid coupling, stepped gear designs originally offered better economy.

U. S. Auto Output

Passenger Only

	1956	1955
January	612,700†	659,719
February		675,769
March		794,188
April		754,007
May		724,891
June		649,372
July		659,979
August		614,392
September		461,592
October		517,669
November		748,559
December		682,698†
Total		7,942,983†

Week Ended	1955	1954
Dec. 31	105,670	124,250
	1956	**1955**
Jan. 7	125,245	150,585
Jan. 14	149,995	155,109
Jan. 21	144,729	161,150
Jan. 28	137,177†	160,666
Feb. 4	132,000*	164,265

†Preliminary *Estimated by STEEL

Source: *Ward's Automotive Reports*

Current designs of the torque converter are batting in the same league now, but earlier units suffered by comparison with the stepped gear transmission.

Future—General Motors Corp. says that from 1939 through 1955, its Detroit Transmission division has built over 7 million Hydramatic units for passenger cars. Available reports estimate that between 1948 and the end of last year, a total of 11 million torque converter transmissions have been produced.

Does this mean the torque converter is taking over? Not exactly, says Mr. McFarland, at least not in its present form. He believes that these two concepts will continue to blend together. He predicts the use of more fluid in stepped gear transmissions and greater use of gearing for torque converter types.

Another Angle—There also are two concepts of engine-transmission assemblies which may be expanded. Using engines, transmissions, rear axles and car weight as a measuring group, one method (similar to European practices) is to use low numerical axle ratios and relatively small engines. Large transmissions give gear ratios which are shifted often to meet performance requirements. This design gives outstanding fuel economy and relatively good performance.

A second approach is to use larger engines with similar axle ratios and smaller transmissions. Performance standards would be met without such frequent gear shifting.

Although the second concept is practical, Mr. McFarland indicates that a lot of basic redesigning must be done on engines for part-throttle fuel economy if they are to meet the increasing performance standards set up in present designs.

Exhaust Notes

Packard's Clipper division of Studebaker-Packard Corp., has a special engineering section to study horn sounds. Aim is to develop a dulcet tone that connotes a polite request rather than an insulting demand.

FACTS

about

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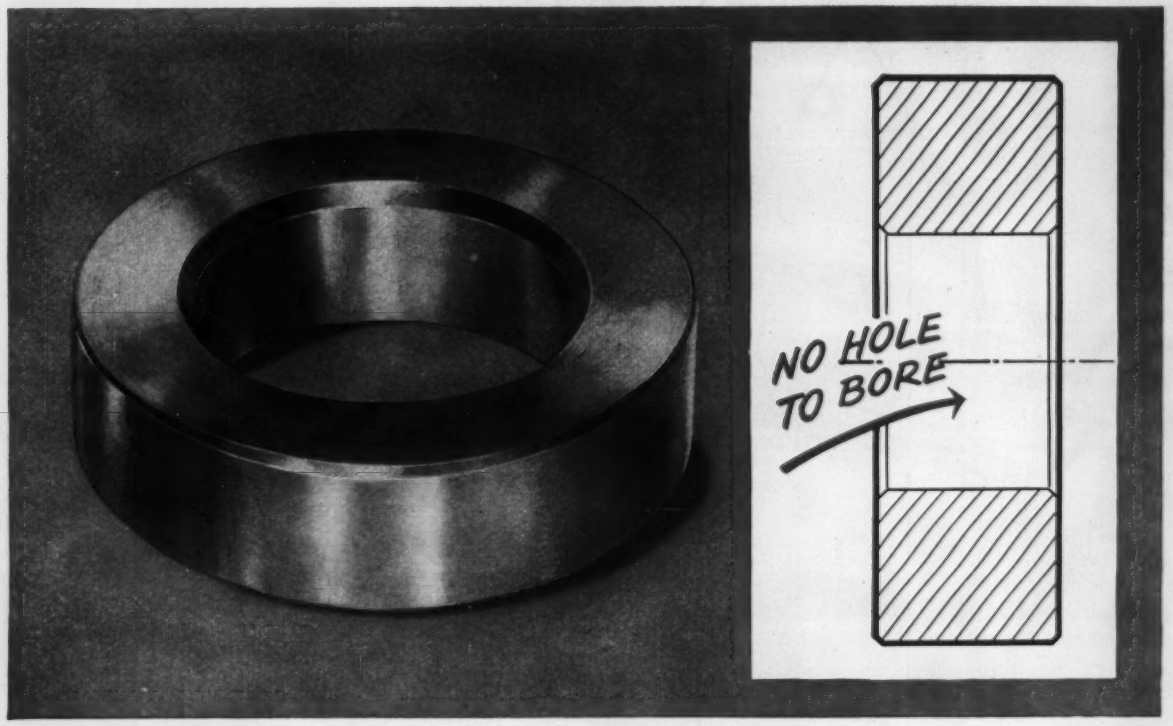


Steps up gear blank production 300% by switching from bar stock to TIMKEN® steel tubing

AN engine manufacturer felt that his gear blanks were costing him too much to make. The center hole had to be bored out of solid bar stock. It took a whole hour to turn out 29 blanks. And a lot of steel was wasted in the process.

So the manufacturer discussed his problem with metallurgists of the Timken Company, experts in fine alloy steel. After study they recommended a change in production methods together with a switch to Timken® seamless steel tubing in place of bar stock.

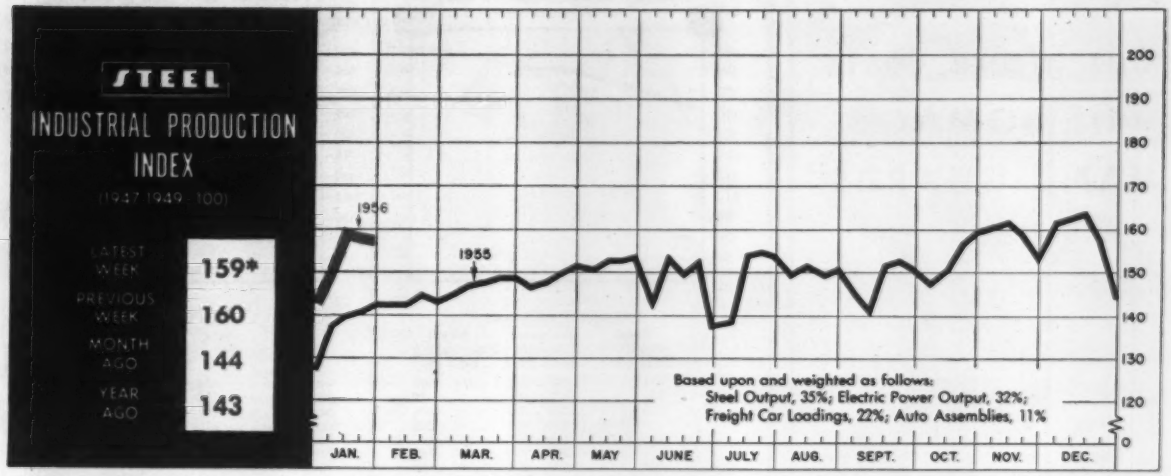
With Timken seamless steel tubing, the center hole is already there. It doesn't have to be bored out. Finish boring was the engine maker's first production step. And with Timken steel tubing his gear blanks are now being turned out at 120 to 130 an hour—an increase of 300%.

Machining costs have been cut by more than half. And because the center hole is "built-in", no steel is wasted.

The files of the Timken Company contain records of hundreds of problems that have been solved by Timken fine alloy steel. If you have a tough steel problem, why not bring it to us? Wire, write or phone The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

SPECIALISTS IN FINE ALLOY STEELS, GRAPHITIC TOOL STEELS AND SEAMLESS TUBING



Week ended Jan. 28*

Optimism Spreads in Steel Industry

AS FAR as the steel industry is concerned, 1956 is going to be a whopping big year. It has started out that way, at any rate, with the industry setting weekly output records three weeks in a row.

American Iron & Steel Institute reports production for the week ended Jan. 29 was 2,472,000 net tons for ingots and castings, or 100.4 per cent of the industry's weekly capacity. This exceeds the record set in the previous week (2,437,000 tons) and points the way for a record month in January. AISI predicts the output for the week ended Feb. 5 was 2,406,000 tons, but the institute consistently has been conservative during the last few weeks. Even at that, such tonnage would have been a record only three months ago.

Catching On — The optimism within the steel industry is spreading. Bethlehem Steel Corp.'s Chairman Eugene G. Grace says: "Personally, I am much more optimistic than some of the others that business will be good beyond the next six months. We're going to have a good demand for steel throughout the entire year."

The greatest demand for Bethlehem's steel comes from the construction industry for structurals, Mr. Grace says. Not far behind is plate demand. "Bethlehem's order books for new cars and materials for repair jobs on cars are booked for a full year ahead and brings this department's schedules into 1957. Something unusual will have to happen before we will have excess production over consumption."

Charles R. Hook, chairman of Armco Steel Corp., says: "Last year Armco made the best overall performance record in its history, and we are looking forward to another good year in 1956."

Elsewhere—Outside the steel industry, things look just as bright with few exceptions. Edward R. Martin, director of marketing and statistics for the Gas Appliance Manufacturers Association Inc., says that 1956 looks like an even better year than its predecessor. After forecasting a gross national

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	2,406[1]	2,472	2,070
Electric Power Distributed (million kw-hr)	11,550[1]	11,521	10,003
Bitum. Coal Output (1000 tons)	10,550	10,600	8,500
Petroleum Production (daily avg—1000 bbl)	7,050[1]	7,045	6,677
Construction Volume (*ENR*—millions)	$362.3	$608.2	$258.5
Auto, Truck Output, U. S., Canada (*Ward's*)	170,596[1]	176,479	190,468
TRADE			
Freight Car Loadings (1000 cars)	700[1]	699	642
Business Failures (Dun & Bradstreet)	225[1]	269	255
Currency in Circulation (millions)[3]	$30,361	$30,632	$29,752
Dept. Store Sales (changes from year ago)[3]	+3%	+5%	+10%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$22,164	$22,798	$20,173
Federal Gross Debt (billions)	$280.3	$280.2	$278.5
Bond Volume, NYSE (millions)	$24.3	$22.5	$19.3
Stocks Sales, NYSE (thousands of shares)	10,613	11,372	16,811
Loans and Investments (billions)[4]	$85.5	$85.7	$85.4
U. S. Govt. Obligations Held (billions)[4]	$29.5	$29.7	$36.6
PRICES			
STEEL's Finished Steel Price Index[5]	209.10	209.10	194.53
STEEL's Nonferrous Metal Price Index[6]	269.7	270.4	215.8
All Commodities[7]	111.6	111.5	110.1
Commodities Other Than Farm & Foods[7]	119.8	119.9	115.2

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1956, 2,461,893; 1955, 2,413,278. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-1939=100. [6]1936-1939=100. [7]Bureau of Labor Statistics Index, 1947-1949=100

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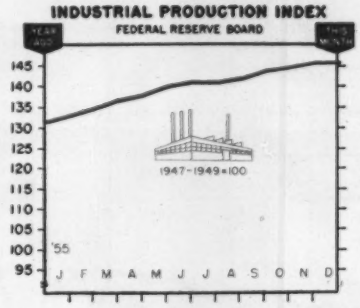
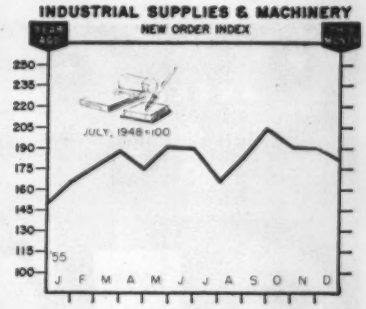
THE BUSINESS TREND





(seasonally adjusted)

	Total Production		Primary Metals		Metal Fabricating	
	1955	1954	1955	1954	1955	1954
Jan.	131	125	127	111	156	155
Feb.	133	124	131	108	157	152
Mar.	135	123	135	103	158	148
Apr.	136	123	138	104	160	146
May	138	124	140	106	162	147
June	139	124	143	108	163	145
July	139	124	134	104	167	148
Aug.	140	123	139	105	170	148
Sept.	142	124	146	117	171	148
Oct.	143	126	148	110	173	149
Nov.	144	128	149	118	172	152
Dec.	144*	130	151*	121	170*	155
Avg.	138*	125	140*	110	165*	150

Federal Reserve Board. *Preliminary

	1955	1954	1953
Jan.	164.4	139.8	157.4
Feb.	175.1	140.5	172.9
Mar.	186.9	141.5	188.2
Apr.	173.7	131.9	182.1
May	191.6	129.4	171.1
June	189.1	136.4	160.0
July	163.7	119.4	155.3
Aug.	181.2	132.5	139.6
Sept.	203.2	148.1	150.6
Oct.	190.0	136.3	146.0
Nov.	189.7	146.2	144.8
Dec.	180.0	148.8	136.7

Amer. Supply & Machinery Mfrs.' Assn.

Charts copyrighted, 1956, STEEL

product of $406 billion, Mr. Martin summarizes the gas appliance industry as follows:

Domestic gas ranges: 2,289,000 units shipped in 1956 against about 2,277,000 last year, exclusive of built-ins. If added on, this latter group "could carry over-all gas range sales to a point well above last year's volumes."

Automatic gas water heaters: Shipments of 2,773,000 units compared with 2,762,000 last year.

Central heating units: 1,224,600 compared with 1,151,000 last year.

Gas direct heating units: 1,545,000 against 1,470,000 in 1955.

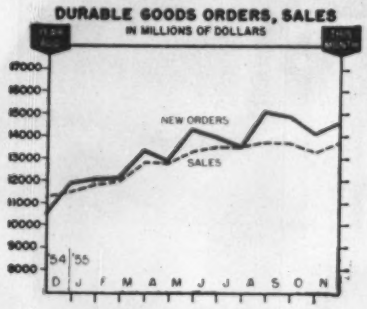
In addition, Mr. Martin predicts that the record sales of 365,000 gas-fired clothes dryers in 1955 will be a has-been by the end of 1956. He also says that the nation's gas pipelines will have passed the 500,000-mile mark in 1956—putting a further pinch on plates for pipe; that new construction and expansion by the gas utilities and pipeline companies will cost $1.205 billion; that $50 million will be spent on underground storage pools this year.

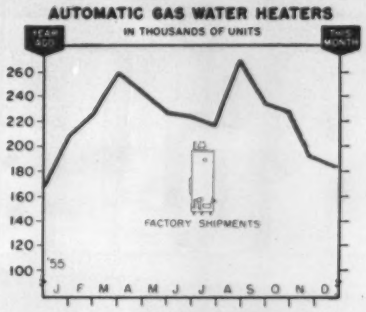
Going Along—Stewart W. Lauer, president of York Corp., goes along with that line of thinking. He says that York anticipates a 1956 sales increase of air conditioning and refrigeration products and systems between 12 and 13 per cent over 1955. Furthermore, he believes York, and the industry as a whole, will have an annual volume improvement of about 12 or 13 per cent a year through 1960.

STEEL's Index Levels Off

STEEL's industrial production index has not yet shown concrete results of this business optimism. The main reason is the slip in auto production. With Detroit cutting back even further as January bows out, the index slipped to an estimated 159 (1947-1949 = 100), for the week ended Jan. 28, from the previous two weeks of 161 and 160. The other three components of the index—steel, electrical output and freight car loadings—have shown unusual strength in overcoming reduced auto production.

When the automobile picture will brighten up may be determined by the sales incentive programs now under way in the industry. Sales for the first 20 days of January (307,000 units) are running 2000 behind the similar period last year. Thus, it would seem that dealer's stocks are bound for an even higher level than at the turn of the year—possibly 800,000 units, says





	New Orders*		Sales*	
	1955	1954	1955	1954
Jan.	12,142	9,376	11,850	11,381
Feb.	12,170	9,394	12,029	11,248
Mar.	13,353	9,585	12,860	11,303
Apr.	12,879	9,619	12,805	11,160
May	14,331	9,588	13,322	11,066
June	14,033	9,822	13,527	11,293
July	13,571	9,407	13,503	11,153
Aug.	15,145	9,756	13,745	10,907
Sept.	14,936	11,153	13,692	10,832
Oct.	14,132	10,790	13,302	10,295
Nov.	14,631†	10,491	13,720†	11,314
Dec.	.....	11,963	.....	11,570

*Seasonally adjusted. †Preliminary
U. S. Office of Business Economics

	Shipments—Units		
	1955	1954	1953
Jan.	210,900	164,400	189,900
Feb.	228,400	175,000	194,200
Mar.	263,100	187,800	207,400
Apr.	245,200	200,800	209,500
May	229,400	195,600	183,300
June	227,100	206,700	181,200
July	219,300	190,300	178,900
Aug.	275,600	207,100	168,100
Sept.	237,100	205,500	179,000
Oct.	231,200	202,000	194,300
Nov.	195,500	179,100	155,000
Dec.	187,500*	166,800	141,900
Total	2,750,300*	2,281,100	2,182,700

*Preliminary
Gas Appliance Mfrs. Assn.

Ward's Automotive Reports. Some of the sales expected in the earlier part of the month probably were held up until the sales incentive programs got under way, says *Ward's.* But unless there is a sudden spurt in the salesroom, producers will cut production to 606,000 units in February, or about 1.1 per cent under January. The Big Three are all anticipating the drop, says *Ward's,* but the independents are aiming at higher goals.

Construction Rolls On

Construction isn't about to roll over and play dead, according to the lastest figures from *Engineering News-Record.* Heavy construction awards amounted to $362.3 million for the week ended Jan. 26, bringing the total for the year up to $1,592,837,000. That's a hefty 23 per cent ahead of this time last year. Private construction was down from the unusually good week of Jan. 19, but public awards charged ahead on the strength of sewerage construction in the Pittsburgh area.

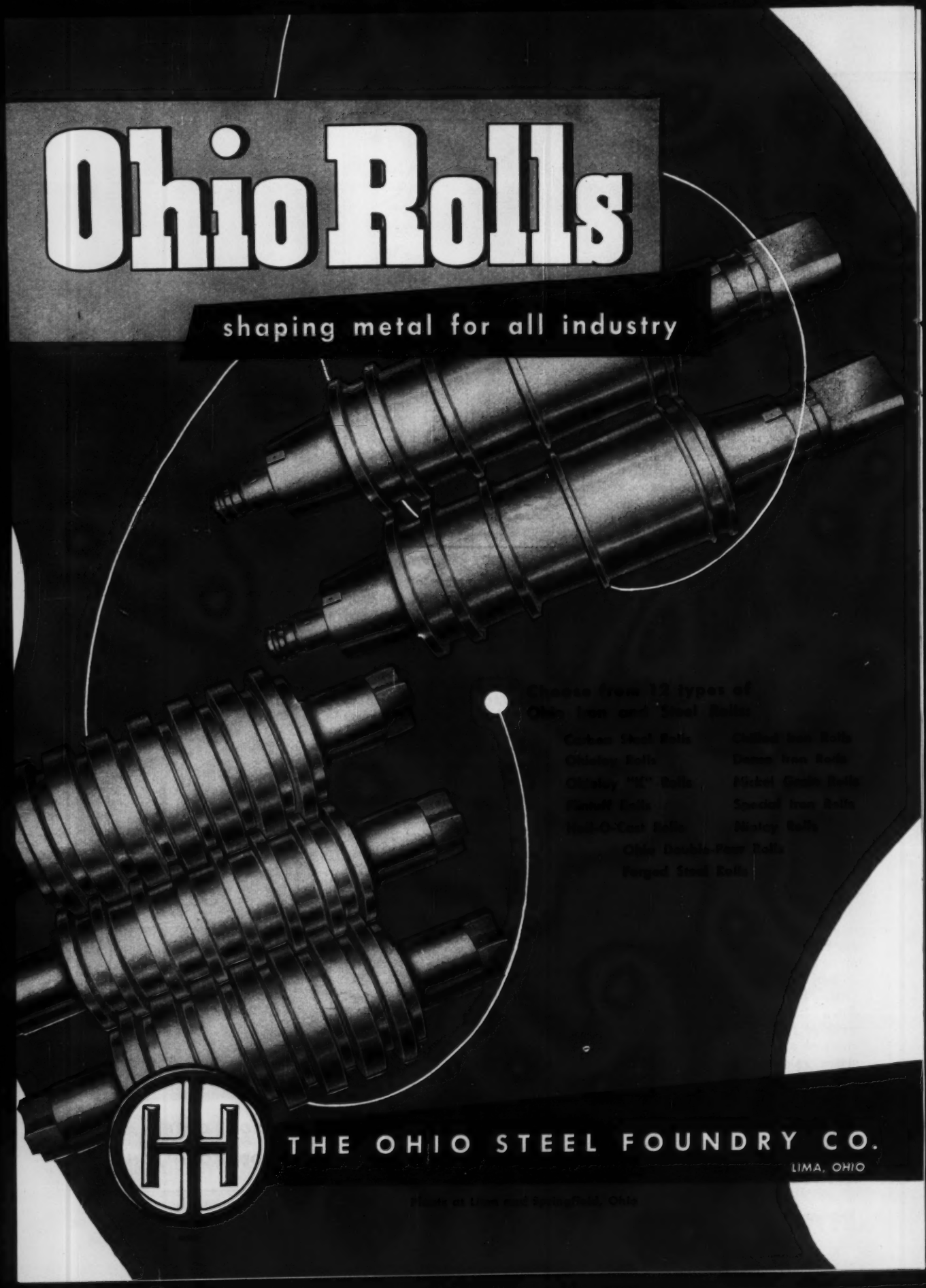
Dr. George C. Smith, economist for F. W. Dodge Corp., told the National Association of Home Builders that he expects home-building to continue at high levels for the next decade or more. "Even though we expect the number of nonfarm housing starts in 1956 to drop about 10 per cent below last year, the trend toward larger and more expensive homes will mean that dollar volume will not go down nearly as much as that."

If there is a serious decline in new building, the industry hopes to more than recoup its losses in the home repair and modernization campaign kicked off on a nationwide basis last month. Albert M. Cole, administrator of Federal Housing & Home Finance Agency, has estimated this market at close to $15 billion this year. Five Cleveland banks have led the way in making financing for these projects easier. They will allow larger loans with longer terms at regular home mortgage banking interest.

Trends Fore and Aft

The American Gear Manufacturers Association index increased 16.7 per cent from November to December, reaching 245.5 (1947-1949=100). The index average for the year was 199.2.

The backlog of orders for fabricated structural steel rose to 2,243,046 tons as of Dec. 31, says the American Institute of Steel Construction. This is the highest mark since April, 1952.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Forged Steel Rolls
THE OHIO STEEL FOUNDRY CO.
LIMA, OHIO
Plants at Lima and Springfield, Ohio

JOHN E. NEWLIN JR.
. . . mgr. of Carpenter tool steel sales

EDWARD E. HELM
. . . Reliance Electric v. p.-gen. mgr.

WILLIAM R. TOEPLITZ
. . . heads Bound Brook Oil-Less Bearing

John E. Newlin Jr. was appointed manager of tool steel sales, **Carpenter Steel Co.**, Reading, Pa., succeeding **Norman W. Calkins.** Mr. Newlin was with Henry Disston & Sons Co., and served for the last few years as sales manager, steel and armor divisions.

Giddings & Lewis Machine Tool Co., Fond du Lac, Wis., reorganized into four operating divisions. General managers of the separate units are: **Edgar L. McFerren**, vice president-general manager, G & L Hypro Division; **Erwin J. Kaiser**, general manager, Davis Boring Tool Division (both at Fond du Lac); **Allan L. McKay**, vice president-general manager, Cincinnati Bickford Division, Cincinnati; and **Erich C. Wussow**, vice president-general manager, Kaukauna Machine & Foundry Division, Kaukauna, Wis.

J. Harvey Johnston, vice president of **General Steel Castings Corp.**, was appointed a vice president of its subsidiary, **National Roll & Foundry Co.**, Avonmore, Pa. **Roy A. Gezelius** was named vice president of both companies.

Alco Products Inc., Schenectady, N. Y., appointed **Capt. C. S. Seabring** director of research and development, effective Mar. 1, following his retirement from the Navy. **Joseph W. S. Davis** was made manager of field sales, spring and forge products.

Edward E. Helm was elected vice president and general manager, **Reliance Electric & Engineering Co.**, Cleveland. **Charles R. Sutherland** was made controller. Mr. Helm was sales vice president. **Richard A. Geuder** was made general sales manager and **Earl C. Barnes** assistant chief engineer.

Charles V. Nicholson, former manager, International Division, was appointed general manager of product sales for **F. J. Stokes Machine Co.**, Philadelphia.

Robert G. Hess was elected executive vice president, **Pesco Products Division**, Borg-Warner Corp., at Bedford, O. He was vice president-operations.

J. D. Neuman was elected vice president and director of purchases at **Sharon Steel Corp.**, Sharon, Pa.

SKF Industries Inc., Philadelphia, appointed **William A. Sine Jr.** general supervisor, production control and procurement.

O. K. Tool Co. Inc., Milford, N. H., appointed **Lawrence C. Gaunt** sales manager. He was purchasing agent.

Martin Vander Laan was made manager of operations, engineering division, **Hewitt-Robins Inc.**, New York.

William R. Toeplitz, formerly vice president-engineering, was elected president of **Bound Brook Oil-Less Bearing Co.**, Bound Brook, N. J. He succeeds the late **W. F. Jennings. Harold O. Johnson**, executive vice president-treasurer, was elected chairman of the board and treasurer. **Samuel S. Connor** was named vice president-secretary; **E. B. Schoenly** factory manager, and **H. E. Thornton** chief engineer.

Henry G. Dacey was named general sales manager and **Thomas A. Fribley** assistant general sales manager, **Cleveland Cap Screw Co.**, Cleveland.

John J. Sheehan was made vice president-sales, **Allied Steel Products Corp.**, Newport, Del. He was general manager.

Francis J. O'Brien was made works manager, Ambridge, Pa., plant, **National Electric Products Corp.**, succeeding **Leo F. Brown.** Mr. O'Brien was production manager.

Worthington Corp., Harrison, N. Y., elected **Elston J. Tribble** and **Aloysius M. Tullo** vice presidents. Mr. Tribble will supervise a group of operating divisions organized under a decentralization program. Mr. Tullo continues as general manager, Harrison Division.

George W. Kropp was made superintendent of **Republic Steel Corp.'s**

LORNTS B. NILSEN
. . . Lewis-Shepard's chief engineer

E. MARK NEASE
. . . Pittsburgh Screw & Bolt purchasing

SIDNEY J. BARBER
. . . appointment at E. F. Houghton & Co.

Niles, O., strip tin division, Warren district.

Lornts B. Nilsen was made chief engineer of **Lewis-Shepard Co.**, Watertown, Mass. He was chief engineer of Compo Shoe Machinery Corp.

Following the Apr. 1 meeting of **Inland Steel Co.**, Chicago, **Clarence B. Randall**, board chairman, and **Edward L. Ryerson**, chairman of the executive committee, will retire. Both will serve as consultants. **Joseph L. Block**, president, will assume duties of chief executive officer. The post of chairman will not be filled. **P. D. Block Jr.** was elected senior vice president and continues as officer in charge of raw materials. **Neele E. Stearns** was elected assistant to the president and continues as vice president-planning and administration.

Eugene M. Ehrbar was made midwest district sales manager at Chicago for **Republic Steel Corp.'s** steel and tubes division. He replaces **Arthur J. Brandt**, retired.

Appleton Electric Co., Chicago, elected **I. W. Strong** executive vice president and **Elmer V. Aldridge** assistant vice president-sales.

George Denny was made district sales manager and **Andrew Eshman** district service engineer for **Mallory-Sharon Titanium Corp.** Offices are at Hollywood, Calif.

E. Mark Nease was made director of purchases, **Pittsburgh Screw & Bolt Corp.**, Pittsburgh. He succeeds **Clarence H. Rindfuss**, retired. **George E. Horney**, executive vice president, has also retired.

Paul T. Dowling was made vice president-sales engineer, **Nooter Corp.**, St. Louis.

M. J. Berry was elected president and chairman of **Ransdale Metals Co.**, San Diego, Calif.

Clyde C. Logue was made manager, light metals division, **Thompson Products Inc.**, Cleveland.

William W. Henderson was made assistant general sales manager, **R. Hoe & Co. Inc.**, New York.

Blair T. Martin was made assistant sales manager at **Perfect Circle Corp.**, Hagerstown, Ind.

L. H. Kramer joined **Union Asbestos & Rubber Co.** as general manager, heating and cooling division, Chicago. He was executive vice president-general manager, American Well Works.

American Smelting & Refining Co., New York, elected **Adin A. Brown** vice president-mining operations. He succeeds **R. F. Goodwin** who will devote full time to Southern Peru Copper Corp. **Donald K. Wright** was named manager, by-products sales, to replace **Leslie G. Matthews**, retired.

Sidney J. Barber was named manager, metalworking products department, **E. F. Houghton & Co.**, Philadelphia. He succeeds the late **James McElgin. Claude G. Wall** replaces Mr. Barber as supervisor of metalworking research.

Harry J. Moore Jr. was made assistant director of purchasing for **International Business Machines Corp.**, New York.

Edward J. Reagan was appointed manager of stainless steel sales, **Universal - Cyclops Steel Corp.**, Bridgeville, Pa.

Young Bros. Co., Cleveland, elected **James D. Russell** vice president-general manager.

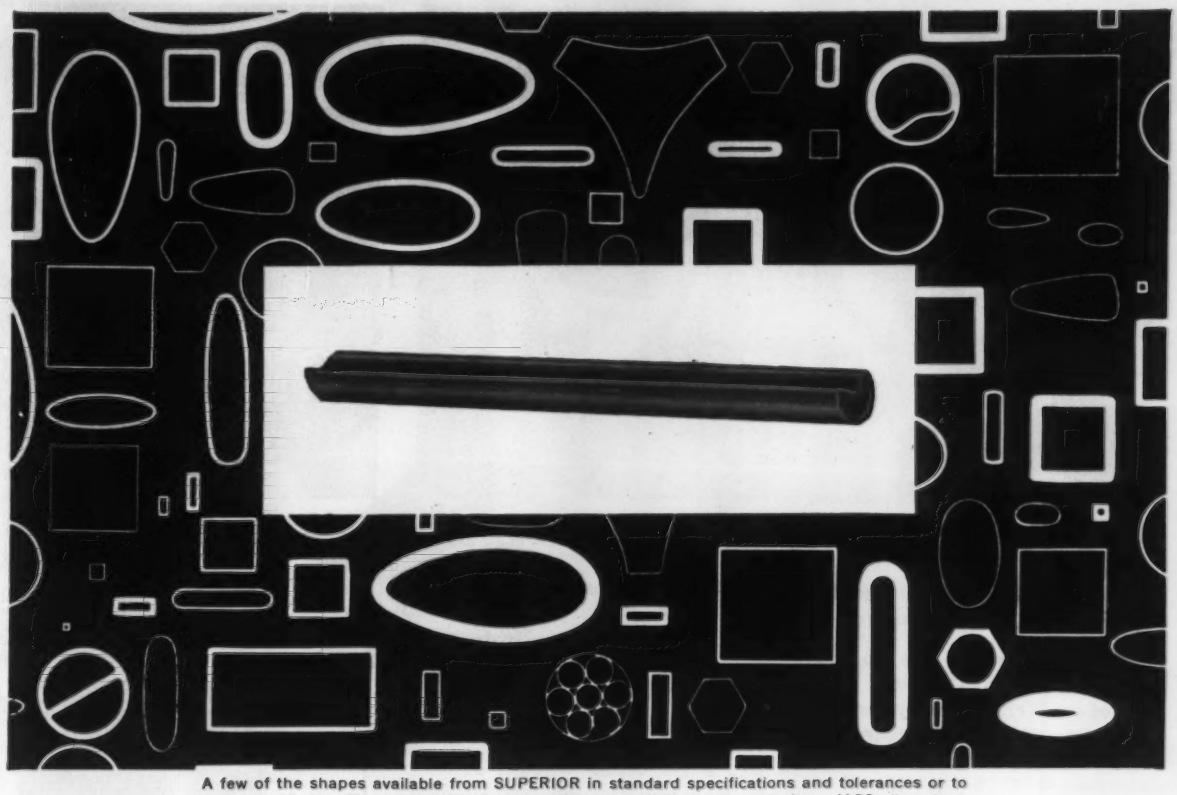
J. W. Kiddy was made manager, rotary drill and air tool divisions. **Davey Compressor Co.**, Kent, O.

William K. Hooper was made manager of **Republic Etched Products Inc.**, Danbury, Conn., subsidiary of Republic Foil & Metal Mills Inc.

Thomas E. Moffitt was elected executive vice president and **R. Wolcott Hooker** senior vice president of **Hooker Electrochemical Co.**, Niagara Falls, N. Y.

Fred E. Rau was made assistant hoist sales manager, **Yale & Towne Mfg. Co.**, Philadelphia. **Richard H. Marsh** was made Worksaver and Warehouser sales manager.

Robertshaw-Fulton Controls Co.



A few of the shapes available from SUPERIOR in standard specifications and tolerances or to your own design. The tube in the foreground is a gun drill shank made from 4130 alloy steel.

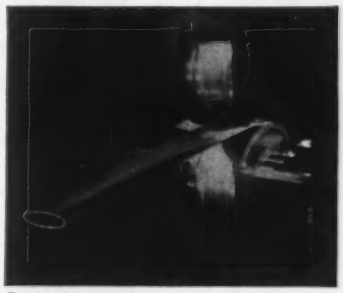
Save time and money on special shaped tubing

"SUPERIOR" TUBING IS IMMEDIATELY AVAILABLE IN A WIDE RANGE OF SHAPES, FORMS, ALLOYS

Many manufacturers have discovered that SUPERIOR's ability to supply as standard what many firms consider specialty tubing saves them trouble, time and money. SUPERIOR makes round, square, oval, rectangular, elliptical and flat oval tubing, for instance. It makes capillary tubing, pointer tubing, electronic tubing, telescopic sizes, large OD-light wall tubing. Over 55 analyses are available in carbon, alloy and stainless steels; in nickel and nickel alloys; in beryllium copper, titanium, zirconium.

The gun drill shank shown above and on the right is a good example of SUPERIOR's ability to supply unusual shapes. This newly rediscovered method of producing close-tolerance high-finish holes demands straight, rigid, accurate shanks with a 110° V-groove. SUPERIOR can produce such a shape—and others—in a fraction of the time and cost it would take a customer to form his own.

If you're having difficulty getting the kind of tubing you want, SUPERIOR can undoubtedly help you. Write for your free copy of Bulletin 40—*A Guide to the Selection and Application of Superior Tubing*. SUPERIOR TUBE COMPANY, 2005 Germantown Ave., Norristown, Pa. *On the West Coast:* Pacific Tube Company, 5710 Smithway St., Los Angeles 22, Calif.



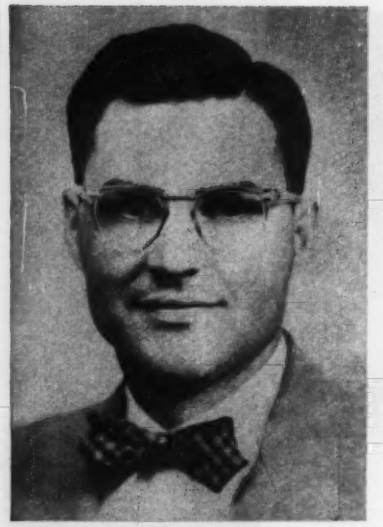
Turks-head rollers converting a round section of SUPERIOR tubing into the typical elliptical shape for a Bourdon gage tube.

Gun drills can produce holes from 4 to 230 diameters or more in 4 times the speed of conventional drilling methods or better. Holes so produced are straight and round to tolerances of 0.0002" or less and wall finishes are 7 mu-in or better.

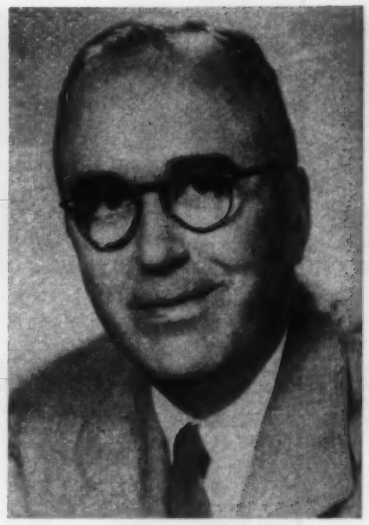
All analyses available in .010" to ⅛" OD; certain analyses in light walls up to 2½" OD

Superior Tube

The big name in small tubing



EDWARD C. MABBS
. . . American Chain & Cable plant mgr.



RUSSEL A. SCHLEGEL
. . . Weston Electrical Instrument post

WILLIAM A. BROWN JR.
. . . Alemite & Instrument Div. gen. mgr.

made **M. R. Gilbert Jr.** Chicago district manager, heating controls.

American Chain & Cable Co. Inc. appointed **Edward C. Mabbs** manager of its Wright-Manley plant at York, Pa. He was in charge of production planning and material procurement at Linde Air Products Co.

Joseph H. Swift was made assistant superintendent, coke and coal chemical works, Fairless Works, **U. S. Steel Corp.**, Fairless Hills, Pa. He succeeds **John F. Holt**, now assistant division superintendent, coke and chemicals division, Gary, Ind., Steel Works.

Elmer L. Casey, recently vice president-operations at Scaife Co., joined **M. H. Treadwell Co. Inc.**, New York, as executive vice president.

Russel A. Schlegel was made manager, industrial product sales, **Weston Electrical Instrument Corp.**, Newark, N. J., a subsidiary of Daystrom Inc.

Jules F. Saut replaces **R. Carter Dye** at Detroit as manager of sales to the automotive industry for **Reynolds Metals Co.**

Ned Woolums was made vice president-manufacturing and **Paul R. Reaver** plant superintendent at **Parker Sweeper Co.**, Springfield, O.

W. J. Hegerty was elected vice president, **Colonial Iron Works Co.**, Cleveland. He was sales manager.

Robert W. Dispennett was named manager-packaging foil sales, **Aluminum Co. of America**, at Pittsburgh.

William A. Brown Jr. was made general manager, **Alemite & Instrument Division**, Stewart-Warner Corp., Chicago. He succeeds the late **Frank A. Hiter.** Mr. Brown was president of Liquid Carbonic Corp.

Byron C. Redeen was made chief engineer at **Lippmann Engineering Works**, Milwaukee.

Charles O. Morris was named assistant manager, pig iron sales, by **American Steel & Wire Division**, U. S. Steel Corp., Cleveland.

George F. Long was appointed assistant manager, reinforcing bars sales, **Inland Steel Co.**, Chicago.

Scott Vrooman was named assistant sales manager, Chicago plant, **Joseph T. Ryerson & Son Inc.**

OBITUARIES . . .

Thomas J. Mooney, 64, production manager, **Laclede Steel Co.**, St. Louis, died Jan. 21.

Harmon J. Cook, 66, president, **Cornwall Patterson Co.**, Bridgeport, Conn., died Jan. 20.

Frank W. Dine, 64, chairman of the board, **Stamco Inc.**, New Bremen, O., died Jan. 6 in Coral Gables, Fla.

George W. Troost, 53, vice president in charge of finance for **Chrysler Corp.**, Detroit, died Jan. 24.

Roland J. Doucette, general sales manager, **Frederick Gumm Chemical Co. Inc.**, Kearny, N. J., died Jan. 4.

H. Parker Adams, 57, purchasing agent and assistant treasurer, **Stevens Walden Inc.**, Worcester, Mass., died Jan. 17.

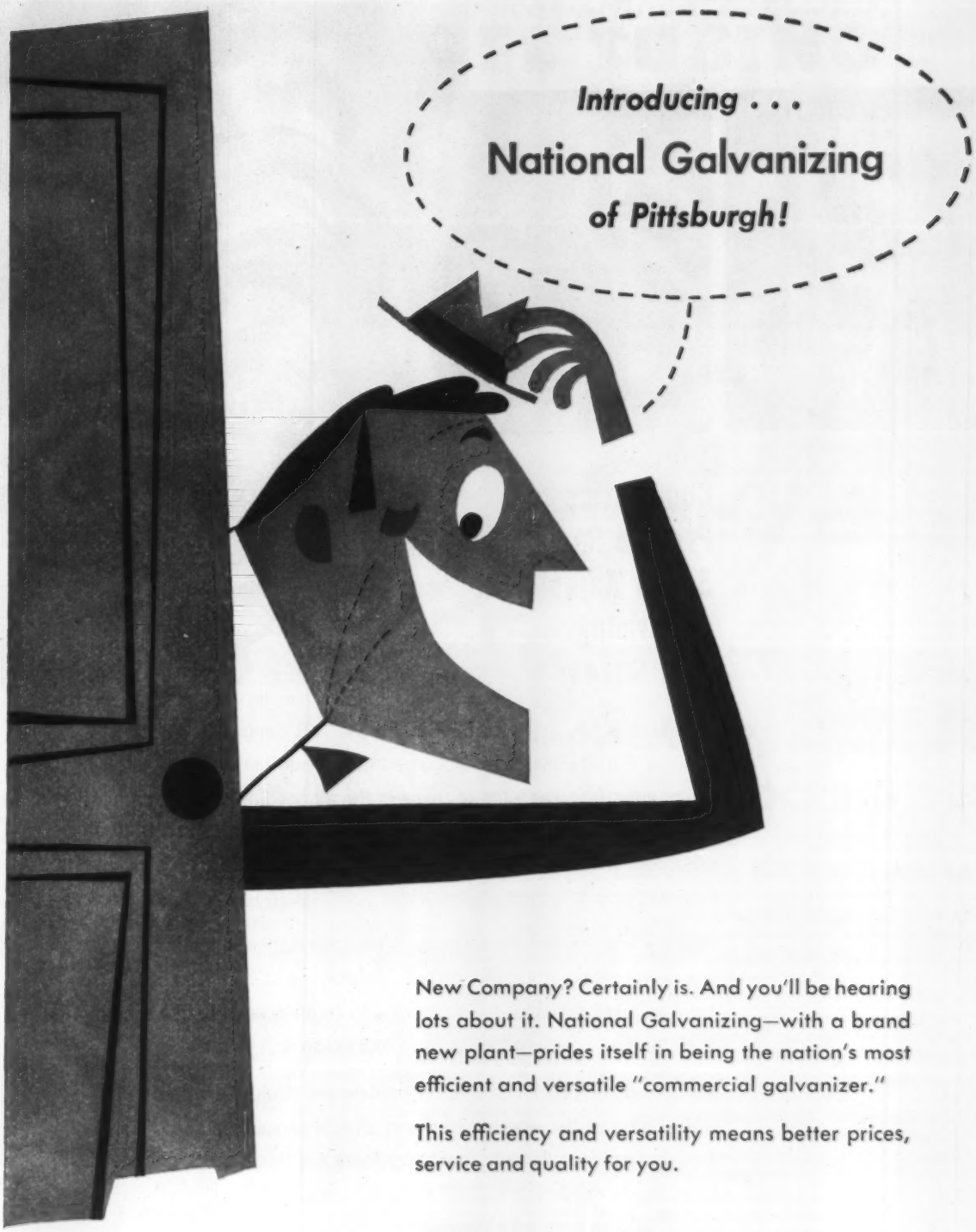
Leo H. Dragat, 46, president-treasurer, **H. Dragat & Sons Inc.**, Hartford, Conn., died Jan. 18.

John C. Cobb, president, **Binghamton Industrial Supply Co.**, Binghamton, N. Y., died Jan. 19.

Thomas J. Woods, 61, superintendent of steel conservation and quality for **Republic Steel Corp.**, Cleveland, died Jan. 24.

John J. Fluck, 61, general manager of the Fresno, Calif., division of **North American Aviation Inc.**, died Jan. 15.

Guerin Todd, 60, engineer and vice chairman of the board of **Hanson-Van Winkle-Munning Co.**, Matawan, N. J., died Jan. 23.



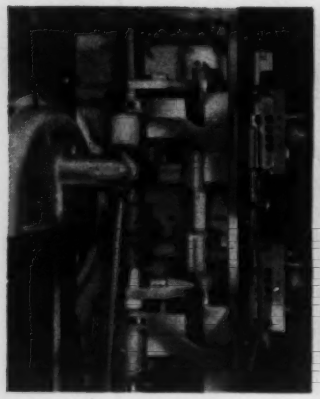
New Company? Certainly is. And you'll be hearing lots about it. National Galvanizing—with a brand new plant—prides itself in being the nation's most efficient and versatile "commercial galvanizer."

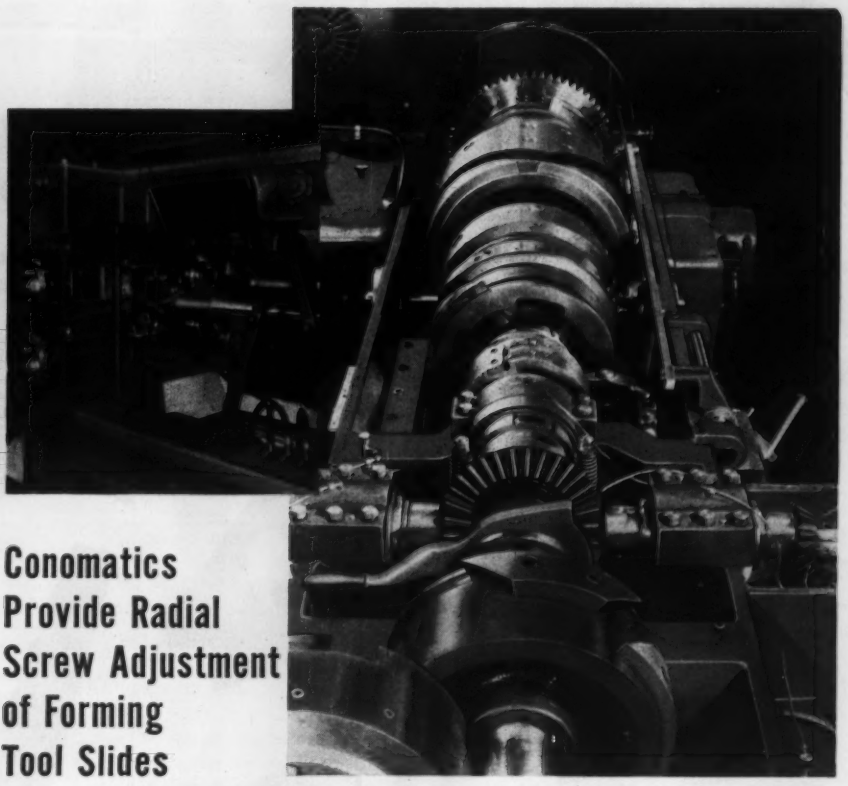
This efficiency and versatility means better prices, service and quality for you.

NATIONAL *galvanizing* COMPANY

Member of American Hot Dip Galvanizers Association

4000 Grand Ave. **SPalding 1-3303** **Pittsburgh 25, Pa.**



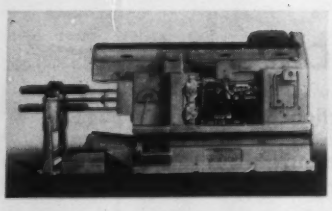


Conomatics Provide Radial Screw Adjustment of Forming Tool Slides

Models 2⅝" LA, 3½" AD, 5" KL, and 5¼" KR Conomatic Four Spindle Bar Machines are equipped with a number of quick job-change features. One of these is the all-position end attachment drive for the mounting of endworking opposed spindles in all positions, with independent feed to as many as three opposed spindles on a single setup.

Another feature that is of considerable importance in tooling up is the radial screw adjustment of all sideworking slides. Trial cuts may be taken to correct diameters with form tools without changing the clamped positions of the form tool holders.

All Conomatic quick changeover models are equipped with dial adjustment of the working stroke of all tool carrying slides. Besides the Four Spindle machines there are three quick change Six Spindle models in 9/16", 1" and 1⅝" sizes. Write, wire, or phone for literature.



Conomatic

CONE AUTOMATIC MACHINE COMPANY, INC., WINDSOR, VT., U.S.A.

Adds Two Furnaces

Allegheny Ludlum will produce high alloys and superalloy steels with new vacuum furnaces

TWO, NEW consumable electrode vacuum furnaces will be producing high alloys and superalloy steels within 90 days at Allegheny Ludlum Steel Corp.'s Watervliet, N. Y., plant, company officials estimate.

The first set of two furnaces began operations three months ago, when Allegheny Ludlum advanced the process from the pilot plant to the production stage.

Double Capacity—With the new furnaces, capacity will be doubled to 500,000 lb of metal per month. Officials note that the added capacity will provide a "tremendous" boost in the availability of vacuum remelted alloys for critical defense use.

Allegheny Ludlum metals have greatly improved properties, particularly: A higher degree of cleanliness; improved workability and ingot soundness; better homogeneity; and improvements in mechanical properties (STEEL, Nov. 21, p. 112).

New Markets—Allegheny Ludlum is studying the production of tool and die steels and stainless steels with this technique.

Potential applications: Where ultrahigh purity is needed. Some applications in bearing materials may also be under investigation.

Koppers Buys New England Firm

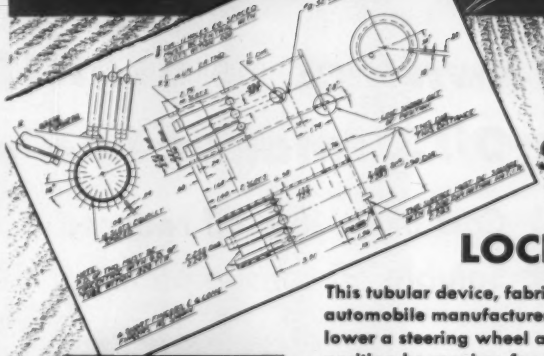
Koppers Co. Inc.'s Metal Products Division, Baltimore, acquired Industrial Sound Control Inc. which has offices at Hartford, Conn., and a factory at Rockville, Conn. One plant, containing about 100,000 sq ft, will continue operations at Rockville as a division of Metal Products.

Stran-Steel Enlarges Plant

Stran-Steel Corp., Ecorse, Mich., is increasing manufacturing facilities at Terre Haute, Ind., by about 20 per cent. Additional fabricating facilities will include new automatic welding equipment. Stran-Steel, a unit of National Steel Corp., makes steel buildings, arch-

(*Please turn to page* 107)

Michigan
Electric Resistance WELDED
STEEL TUBING
Always makes possible Better products at lower Cost



Automotive Steering Wheel
HEIGHT LOCKING DEVICE

This tubular device, fabricated by Michigan for a major automobile manufacturer, enables the driver to raise or lower a steering wheel and lock it into the exact elbow position he requires for greatest driving comfort.

A hand nut on the locking sleeve is turned counter-clockwise one-half and locked at the desired height by a one-half clockwise turn.

The utmost dimensional accuracy is required for this intricate part, which requires a multiplicity of exacting operations for smooth, reliable functioning. It is still another example of the ability of Michigan engineers and production workers to meet the needs of product manufacturers for difficult tubing fabrications produced in volume at low cost.

You are invited to check the dimensions in the drawing at the left. It illustrates the type of problems that our engineering staff is always prepared to solve for Michigan customers.

We will welcome the opportunity to place at your disposal the many years of design and production skills that make Michigan tubular products so superior, so dependable, so economical.

ROUND
¼" to 4" O.D. 7 to 22 gauge

SQUARE	Gauge	RECTANGULAR
¼" to ⅝"	16 thru 22	
¾" to 1"	11 thru 22	⅜" minimum side to 5" maximum side
1" to 2"	11 thru 20	
2" to 3"	11 thru 18	

Carbon 1010 to 1025

Michigan Tubing
has uniform strength, weight, ductility, I.D. and O.D., wall thickness, machinability, and weldability. It can be flanged, expanded, tapered, swaged, beaded, upset, flattened, forged, spun closed, fluted, and rolled. Available in a wide range of sizes, shapes and wall thicknesses, prefabricated by Michigan or formed and machined in your own plant.

Michigan ELECTRIC RESISTANCE WELDED STEEL TUBING
THE OLDEST NAME
STEEL TUBE PRODUCTS CO.
Nearly 40 Years in the Business
9450 BUFFALO ST. • DETROIT 12, MICH.
FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hillside, N. J.—Service Steel Div., Van Pelt Corp., Los Angeles, Calif.—Donald A. Horston, Cleveland, Ohio—Globe Supply Co., Denver, Colo.—W. A. McMichaels Co., Upper Darby, Pa.—A. J. Fitzgibbons Co., Buffalo, N. Y.—William P. Hall & Associates, Dayton, Ohio

Maytag switches to STANICOOL HD *Soluble Oil... makes two-way saving*

1 Cost of soluble oil reduced

2 Soluble oil consumption cut two-thirds

A 300 ton Verson press at the Maytag plant, Newton, Iowa, is used for piercing holes in the inner tubs of Maytag's fine automatic washers. Material used is 18 gauge enameling iron. Holes are pierced in six automatic cycles. A total of 936—$\frac{3}{16}$ inch holes and 6—$\frac{19}{32}$ inch holes are incised in each tub.

A check of manufacturing costs on the tubs disclosed that the cost of soluble oil per unit produced was too high. Standard Oil lubrication specialist J. I. Nelson, working with plant management, suggested a switch to STANICOOL HD Soluble Oil. The switch was made and Maytag received the first part of its two-way saving: the cost of soluble oil per gallon was reduced. Then it was found that the same high quality product could be turned out, without loss of tool life, while spraying only every third tub. Formerly *each* tub was sprayed with soluble oil before punching. With STANICOOL HD, Soluble Oil consumption was reduced two-thirds. And thus, Maytag received part two of its two-way saving.

Perhaps STANICOOL HD Soluble Oil can help you make similar savings. Find out more about this quality soluble oil. Call your nearby Standard Oil office. There is one near you in any of the Midwest or Rocky Mountain states. Or write Standard Oil Company, 910 South Michigan Avenue, Chicago 80, Illinois.

Maytag, leader in cutting laundry time for modern homemakers, knows how to cut manufacturing costs, uses STANICOOL HD.

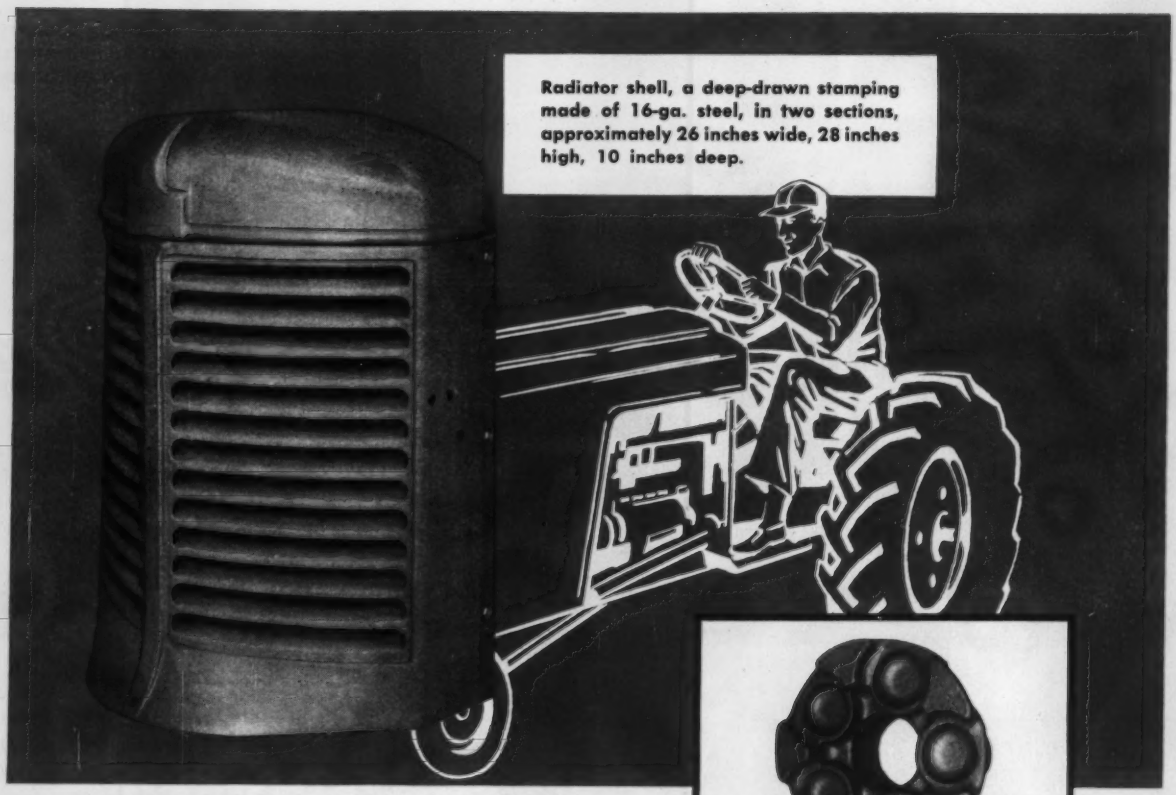
Dwight Norton (right), a Maytag plant foreman, inspects automatic washer inner tub with Jesse I. Nelson, Standard Oil lubrication specialist. Jesse Nelson is well qualified to provide lubrication technical service. He has a B. S. degree in engineering from the University of Iowa and has completed the Standard Oil Sales Engineering School. Jesse has been helping customers with lubrication problems for more than three years. Customers find his experience and training pay off *for them.*

Quick facts about STANICOOL HD Soluble Oil

- Emulsifies readily with all waters.
- Forms stable, uniform emulsion.
- Does not turn rancid.
- Non-injurious to men, machines and work.
- Economical. Meets work requirements with relatively low emulsion concentrations.
- Prevents rusting of work and machines.
- Gives better tool life.
- Doesn't form gum on machines.

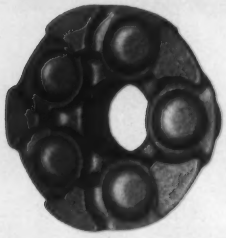
STANDARD

STANDARD OIL COMPANY
(Indiana)



Radiator shell, a deep-drawn stamping made of 16-ga. steel, in two sections, approximately 26 inches wide, 28 inches high, 10 inches deep.

VISUALIZE for yourself savings you can get with T&W TECHNIQUE



T & W Technique produces outstanding forgings, like this aircraft planetary gear, 20 inches in diameter and weighing 65 lbs., produced with the hole pierced.

If you buy stampings or forgings, you see in the illustration on this page the mechanical advancement of *T & W Technique*. *T & W Technique* also embraces other money-saving aspects important to you—assistance on design, planning, quality control, and scheduling of deliveries to fit your needs. To see for yourself, just send the coupon.

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Over 50 years of experience

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Company _____

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1303

T & W DEEP DRAWN STAMPINGS AND FORGINGS USUALLY COST LESS AT THE POINT OF ASSEMBLY

(*Concluded from page* 103)

itectural products, including steel joists and framing, and steel flooring for freight cars.

Boosts Titanium Oxide Output

E. I. du Pont de Nemours & Co., Wilmington, Del., is increasing output at its titanium dioxide plant in Baltimore about 20 per cent. Some new construction and rearrangement of present facilities will be required, but additional equipment will be the major factor in the expansion. The program will be completed early in 1957.

Warner Electric Expands

Warner Electric Brake & Clutch Co., Beloit, Wis., will complete a second manufacturing plant (cost, more than $1 million) by mid-1956. It will be known as the Automotive Division. Products will include small wheel brakes, air-conditioning clutches and electric fan clutches.

Sylvania Electric To Build

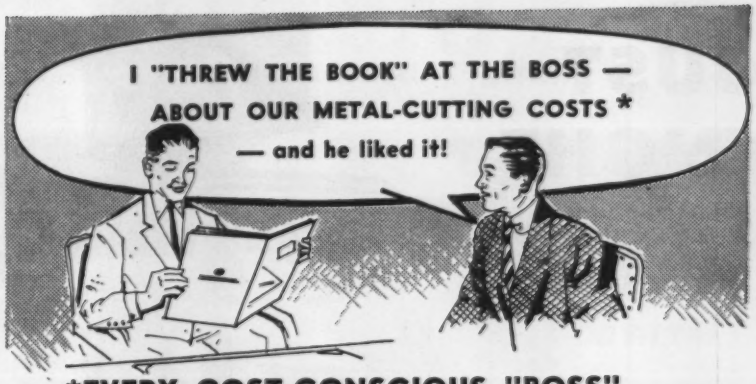
Sylvania Electric Products Inc., New York, will build an engineering and pilot production building in Towanda, Pa., for its Tungsten & Chemicals Division.

Enlarges Research Laboratory

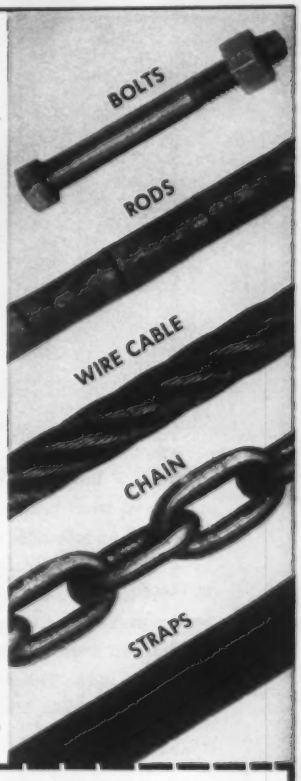
Edward Valves Inc., a subsidiary of Rockwell Mfg. Co., Pittsburgh, is doubling the size of its research laboratory in East Chicago, Ind. The subsidiary builds special valves for high-pressure and high-temperature applications.

Buys Die-Casting Firm

Fort Die Casting Corp., Marysville, Mich., was purchased by a new corporate group and will be operated by the management of Centr-O-Cast & Engineering Corp. and Process Machinery Mfg. Co. Fort's main production is zinc diecastings. It also makes aluminum and lead diecastings and has its own plating facilities. Centr-O-Cast (its main plant is in Detroit) produces permanent mold and centrifugal castings of aluminum. Process Machinery makes centrifugal casting machines and tools and



*EVERY COST-CONSCIOUS "BOSS" WILL LIKE THIS BOOK — if his company cuts any of these materials! —



FREE! FOR YOUR COPY JUST MAIL THE COUPON! . . .

This unusual book — "CUTTING METAL the EASY WAY" — is not a PORTER CUTTER catalog. It's a factual study of comparative metal-cutting labor costs — prepared for those "bosses" who eliminate wasted *minutes* to save *hours* — who know that *dollars* saved daily mean *thousands* saved each year. You'll find it profitable reading.

H. K. PORTER, INC.
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Please send me my FREE copy of "CUTTING METAL the EASY WAY".

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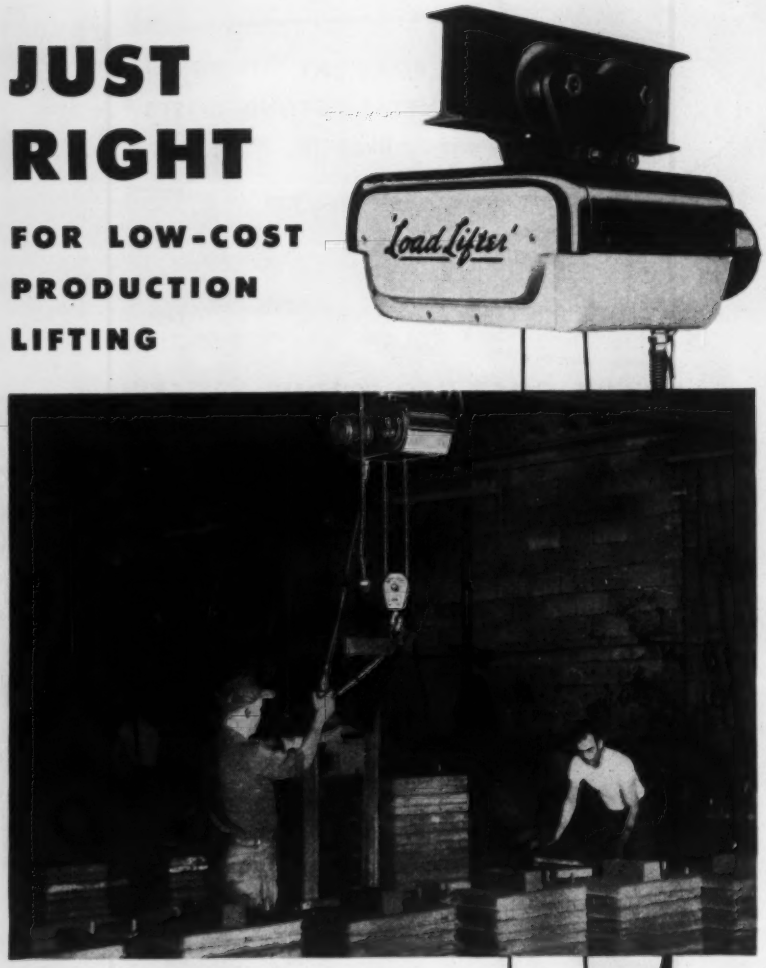
FOR LOW-COST PRODUCTION LIFTING



It takes fast hoisting to keep work moving to and from benches, machines and stock piles on schedule. The Series "600" 'Load Lifter' Electric Hoist operates at 30 FPM to lift ½-ton loads. It has safe 24-volt push-button control to start and stop this fast hoisting instantly. Accurate spotting is easy. The flexible wire rope permits nominal side lifts with complete safety for man, load and hoist.

If your production suffers from slow load handling, learn how the Series "600" 'Load Lifter' Electric Hoist can improve your timetable and cut your costs. Capacities: ½ and 1 ton. All types of suspension. Get details from your "Shaw-Box" Distributor or write us for Bulletin 408.

MAXWELL MANNING M&M & MOORE INC. TRADE MARK

'Load Lifter'® ELECTRIC HOISTS

MANNING, MAXWELL & MOORE, INC.

MUSKEGON, MICHIGAN

Builders of "Shaw-Box" and 'Load Lifter' Cranes, 'Budgit' and 'Load Lifter' Hoists and other lifting specialties. Makers of 'Ashcroft' Gauges, 'Hancock' Valves, 'Consolidated' Safety and Relief Valves, 'American' and 'American-Microsen' Industrial Instruments, and Aircraft Products.

molds for permanent mold and centrifugal casting.

Hahn Buys Sprayer Line

Motch & Merryweather Machinery Co., Cleveland, sold its Triple M Products Division to Hahn Inc., Evansville, Ind., manufacturer of agricultural and garden sprayers. C. R. Kubik, executive vice president of Motch & Merryweather, says the volume of new business in machine tools and cutting tools has increased 35 per cent over a year ago. The sale of the garden tool division will permit closer integration and expansion of the company's established lines of business.

Foundry Forms Two Departments

Alloy Precision Castings Co., Cleveland, established new departments for wax investment casting and shell molding operations. Alloy Precision Castings, a subsidiary of Mercast Corp., New York, is a large producer of mercury investment castings based on the Mercast process.

General Welding Expands

A plant that will increase General Welding Co.'s productive capacity by 40 per cent has been erected in Bethlehem, Pa., by Luria Engineering Co., that city.

American Chain Forms Division

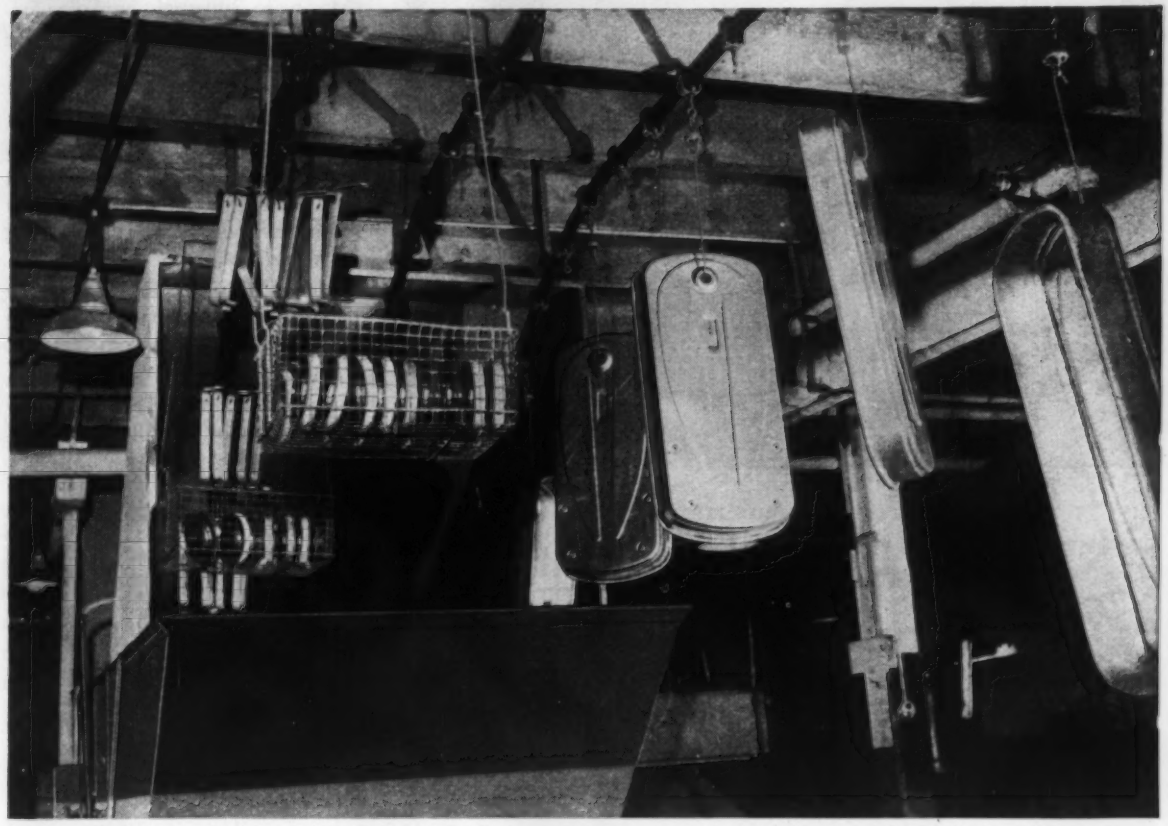
Allison Co., Bridgeport, Conn., a subsidiary of American Chain & Cable Co. Inc., has ceased its corporate existence. It is now known as the Allison Division of American Chain. The division makes rubber and resinoid-bonded abrasive cutting wheels.

Solar Aircraft Builds Plant

Solar Aircraft Co., San Diego, Calif., established a 45,000-sq-ft airframe parts plant in that city to concentrate production on airframe components. Space made available in Solar's San Diego bayfront plant will be used for increased output of gas turbine engines, jet engine components and other products. "Newer aircraft are requiring airframe components

Dow . . . industry's most complete line of chlorinated solvents

DOW



Higher boiling point of DOW PERCHLOROETHYLENE gives parts longer, more thorough cleaning action before parts' temperatures reach that of the vapor. This is a particular saving when tough contaminants like waxes and buffing compounds are being removed.

It's a smooth, no-repeat operation when you're running on highly stable

DOW PERCHLOROETHYLENE

Continuous monorail or cross rod conveyor units need an exceptionally stable solvent to deliver "one stop" vapor degreasing. The major value of these high-speed units is lost if improper solvent fails to degrease parts thoroughly, forcing reruns.

High-boiling DOW PERCHLOROETHYLENE answers this problem with stability to spare. You can't find a solvent with greater resistance to thermal breakdown or deterioration from light and oxygen. This stability *plus* prevents decomposition of DOW PERCHLOROETHYLENE that would harm the units or the load. And this solvent's greater vapor density holds vapor loss far lower.

Contact your local Dow distributor *today* for a profitable fill-in on how you could use this efficient, safe vapor degreasing solvent. You'll want to ask him about "work horse" DOW TRICHLOROETHYLENE, METHYLENE CHLORIDE and sensational, cold-cleaning CHLOROTHENE*, too. For detailed technical information on any of these solvents, just drop a line to THE DOW CHEMICAL COMPANY, Dept. S-942B, Midland, Michigan.

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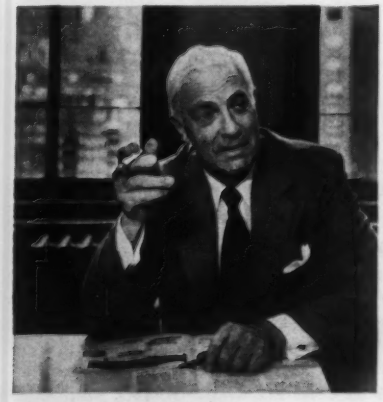
you can depend on DOW CHEMICALS

DOW

(Advertisement)

How Do Lightweight Refractories Cut Fuel Costs And Boost Furnace Output?

Here, certainly, is a timely question. There's a heavy squeeze today on most furnace operators for lower costs, larger production . . . or both. And despite all the economies they've put into effect so far, they're still searching hard for ways to make their furnace dollars do a bigger job.



The following discussion brings out a number of facts, often overlooked, about the money-saving, profit-building potentials inherent in *lightweight* insulating firebrick.

Q. *First of all, just what do you mean by "lightweight" insulating firebrick?*

A. Compared with dense, fireclay brick weighing approximately 7½ to 8½ pounds each, insulating firebrick range from about 3½ pounds down to slightly over 1 pound for various temperature requirements.

Q. *What does this light weight have to do with lower production costs?*

A. Briefly, heavy furnace linings waste your fuel dollars two ways:

They soak up and store large quantities of heat which are lost when the furnace is cooled; and they conduct and lose too much heat through the wall.

Lightweight insulating firebrick, on the other hand, contain millions of tiny air cells, heat up and cool quickly, absorbing and storing very little heat. Also, they resist heat flow, keeping it inside the furnace to do productive work.

Q. *I can see why you would save on fuel — but how much?*

A. There's no single answer to that question — there are too many variables to be considered. But to give you an idea of these savings, here are a few actual examples:

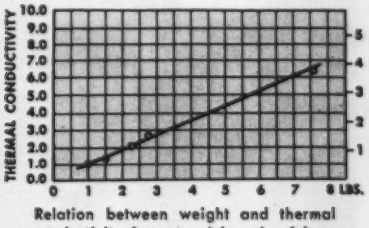
The operator of a large forge furnace cut his fuel costs more than 50% after changing to *lightweight* insulating firebrick.

A manufacturer of electric kilns states that insulating firebrick result in heat savings of fully 25%.

A magnesium melting crucible furnace that formerly used 1,000,000 BTU's per hour now does the same job with 500,000 BTU's, thanks to insulating firebrick.

Q. *Increased production has also been pointed out as an advantage of insulating firebrick. How do you explain this?*

A. Again the answer lies in lightness of weight. Because lightweight firebrick store and conduct less heat, they come up to operating temperature faster — cool down faster, too. This means — shorter heating cycles.



Relation between weight and thermal conductivity for several brands of kaolin base refractories. (mean temperature, 900F)

Secondly, because lightweight firebrick conduct far less heat than heavy, dense firebrick, you don't have to build as thick a wall. This gives you more hearth area per square foot of floor space.

Thirdly, lightweight firebrick respond more rapidly to changes in furnace heat input, which means closer temperature control and fewer rejects in many instances.

It's just like adding extra furnace capacity without adding to your furnace investment.

Q. *Are there any differences in the performance of the various brands of insulating firebrick available?*

A. Naturally, the *lighter* the brick the greater the fuel savings and furnace output. And the lightest insulating firebrick of all, for any temperature range — if you'll pardon our mentioning it — are B&W Insulating Firebrick.

THE BABCOCK & WILCOX CO.
Refractories Division
General Offices:
161 East 42nd St., New York 17, N. Y.
Works: Augusta, Ga. R-808

of steel and titanium alloys to cope with greater speeds and stresses," says E. T. Price, president.

Walworth Buys Conoflow Corp.

Walworth Co., New York, manufacturer of valves and pipe fittings, purchased Conoflow Corp., Philadelphia, a leading producer of pneumatic automatic valve control equipment. It will be operated as an independent subsidiary. This is the fourth acquisition in Walworth's expansion program in less than a year.

ASSOCIATIONS

ELTON E. STAPLES
. . . president, IHEA

Elton E. Staples, executive vice president, Hevi Duty Electric Co., Milwaukee, was elected president of **Industrial Heating Equipment Association Inc.**, Washington. Other officers are: W. H. Holcroft, Holcroft & Co., Detroit, vice president; R. E. Whittaker, Swindell-Dressler Corp., Pittsburgh, treasurer; Carl L. Ipsen, executive vice president.

ANNIVERSARIES

Porter-Cable Machine Co., Syracuse, N. Y., producer of portable power tools, is observing its 50th

(*Please turn to page* 114)

AIR LIFT
for heavy materials

Crowded isles and sluggish flow of materials cost you money. So why not go over the top! You can speed production, cut your costs with Conco Cranes, custom designed for your specific needs. Let us show you how. Write for a trained Conco engineer to call and make recommendations, or request bulletin 3000A covering our complete Conco line. Conco Cranes are backed by 37 years of experience.

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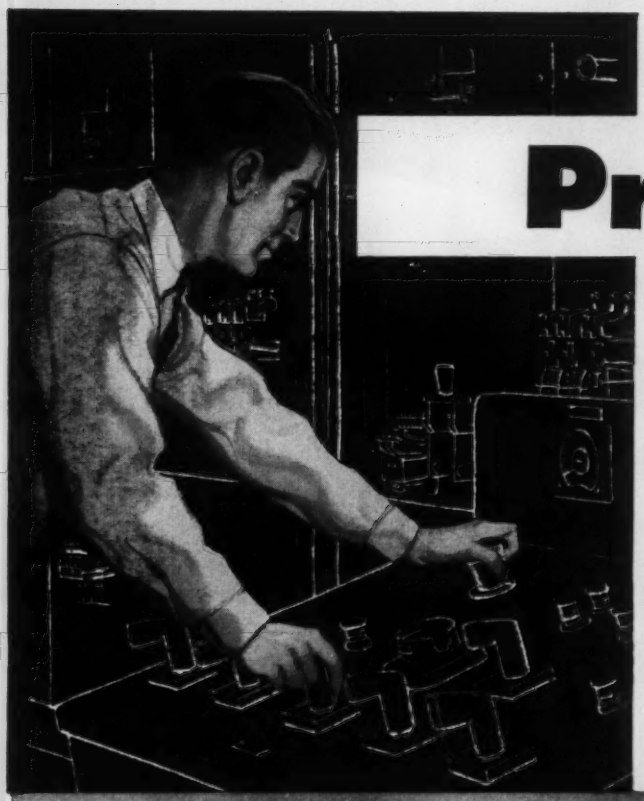

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Allis-Chalmers constant potential and variable voltage systems are providing dependable precision control in many of the nation's largest mills.

When you modernize

to meet the double challenge of a growing market and heavy competition, take advantage of Allis-Chalmers experience. See your nearby representative or write Allis-Chalmers, Milwaukee 1, Wisconsin.

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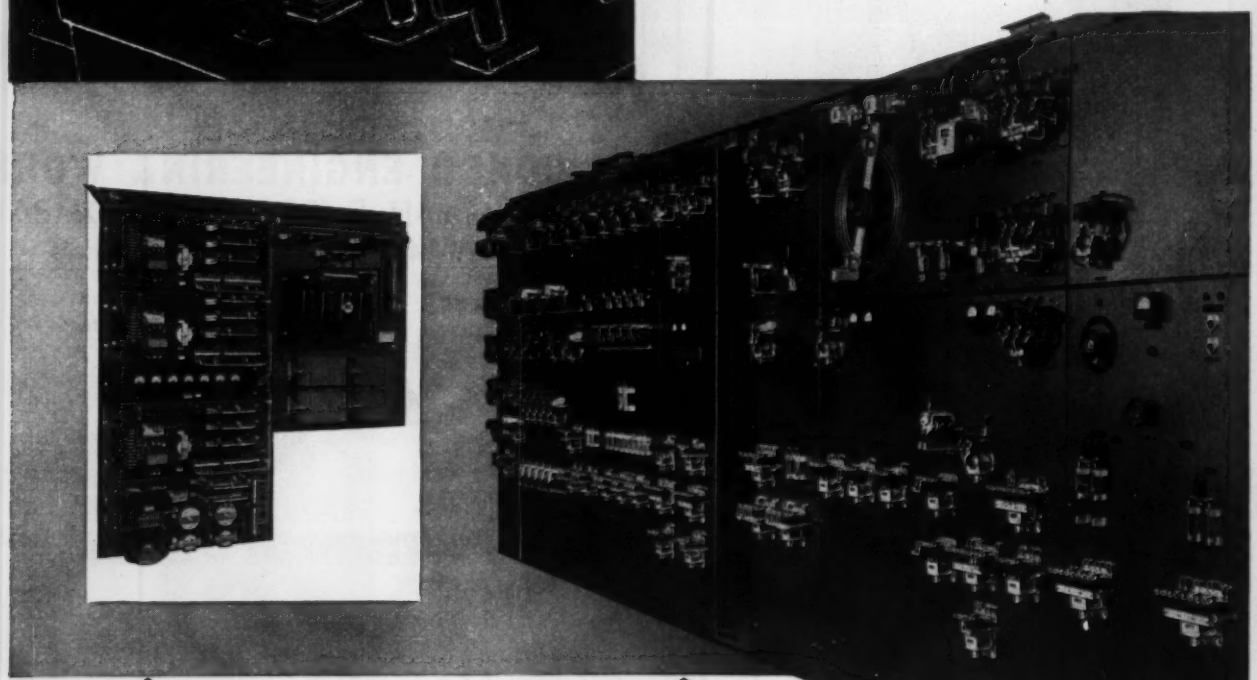

Magnetic amplifier speed regulatory panels.

Variable voltage control board for 39-inch continuous annealing line.

A-C ALLIS-CHALMERS

ALLIS-

STEEL

CHALMERS
Line Control

Entry section control board for pickle line.

Delivery section control board.

Delivery end operator's desk, stainless steel top.

Riveter's cabinet, stainless steel front.

CHALMERS

Kinnear Rolling Doors

Here is a **BIG** factor often overlooked by cost-minded business and industry: The floor and wall space . . . the time and labor . . . the upkeep and repair costs you can save with Kinnear Rolling Doors.

Opening straight upward, they coil out of the way. Their rugged, all-metal, heavily galvanized construction withstands hardest use . . . toughest weather conditions. Built any size, with manual or electric operation. Ideal for old or new buildings of any type.

Write for details on Kinnear Rolling Doors—the BIG value in door efficiency.

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1742 Yosemite Ave., San Francisco 24, Calif.
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Saving Ways in Doorways
KINNEAR
ROLLING DOORS

(*Concluded from page* 111)

anniversary. The company recently purchased the 465,000-sq-ft Brown-Lipe-Chapin plant in that city for about $1.1 million.

NEW ADDRESSES

Timken Roller Bearing Co.'s newly established Memphis, Tenn., office is at 886 S. Third St. R. P. Hall is Timken's Memphis manager.

REPRESENTATIVES

Roll Formed Products Co., Youngstown, manufacturer of continuously rolled metal shapes, appointed Fehlenberg Co., St. Louis, as representative in the central Mississippi valley states.

Mercury Mfg. Co., Chicago, maker of materials handling equipment, appointed Schuette Industrial Sales as representative.

Service Steel Division, Van Pelt Corp., Detroit, manufacturer of steel tubing, appointed R. A. Siewert manager of warehouse sales for its branches. He will continue as manager of the firm's Chicago warehouse. Service Steel, with a mill at Adrian, Mich., has warehouses at Buffalo, Cincinnati, Detroit, Los Angeles and Chicago.

Alloy Steel Inc., Detroit, was appointed a distributor of aluminum rod, bar and wire by **Kaiser Aluminum & Chemical Corp.,** Oakland, Calif. Later, the firm will handle Kaiser sheet, coil, plate and extruded products.

Marion Power Shovel Co., Marion, O., appointed Knight Equipment Co., Richmond, Va., and Machinery & Supplies Co. Inc., Kansas City, Mo., as distributors. They will handle Marion's line of crawler and rubber mounted excavators from ¾ to 4 cu yd in capacity. The firm also appointed L. E. Schaffer, Columbus, O., and G. L. Moritz, Emmaus, Pa., as divisional sales managers in the central and eastern sales areas, respectively.

4-HIGH 6-STAND CONTINUOUS HOT STRIP MILL

(OPERATING IN WALES)

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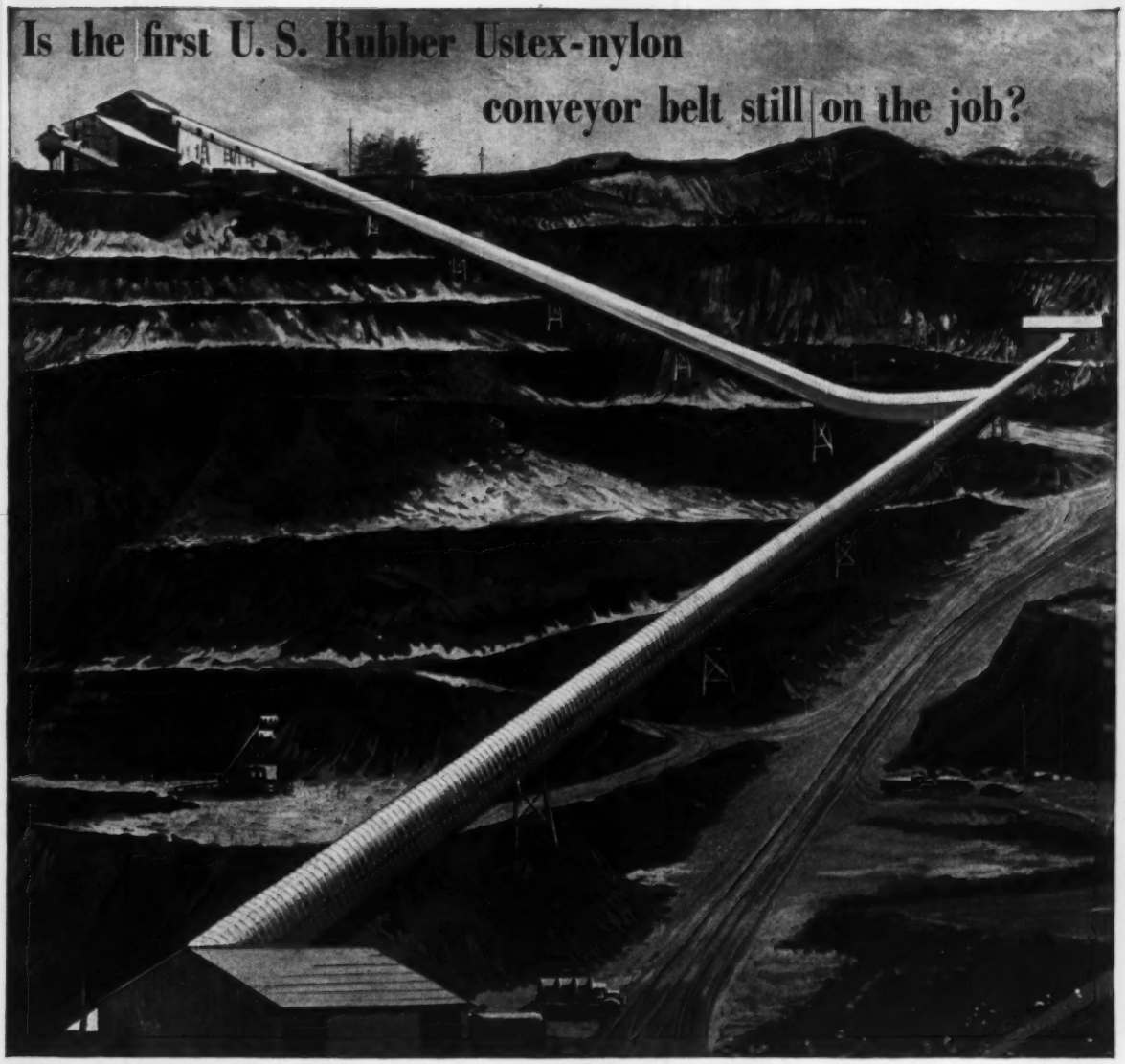
Designers and builders of Ferrous and Nonferrous Rolling Mills, Mill Rolls, Auxiliary Mill and Process Equipment, Presses and other Heavy Machinery. Manufacturers of Iron, Nodular Iron and Steel Castings, and Weldments.



"U. S." uncovered an interesting answer

The very first Ustex®-nylon belt was installed by "U. S." in May, 1948, in a Minnesota iron mine. Originally, it was installed in two sections, to carry 700 tons per hour. After years on this job, carrying over 7,500,000 long tons, the belt was moved to another location to replace a belt of different make that had failed. On its new job the Ustex-nylon belt was spliced in one piece and installed on the job site by "U. S." service engineers. It now handles not 700 tons, but 1200 tons an hour on twice the center distances and a higher lift. In spite of this year after year the belt continues to do *twice the work it did originally!*

This Ustex-nylon belt has Ustex for strength, nylon for flexibility, and is an example of the many pioneering developments of "U. S." in materials haulage. Cut costs to the bone by making use of U. S. Rubber's *Three-Way Engineering*, in which "U. S." engineers work closely with the mine engineers and the conveyor system engineers. Get in touch with one of the 27 District Sales Offices, each staffed with sales engineers, or write us at Rockefeller Center, New York 20, N. Y.

US RUBBER

Mechanical Goods Division

United States Rubber

STEEL
February 6, 1956

Technical Outlook

LOW NICKEL PISTONS—Driving the nickel down to 0.5 max and bringing the zinc up to 1.0 max makes a new automotive piston alloy out of Alcoa's former D132. Aside from the nickel-zinc shift, the new alloy, F132, is the same in content and performs like D132. It has a better chance of survival in a nickel shortage.

BIG HAND FORGINGS—Harvey Aluminum is getting set to meet all requirements for aluminum hand forgings up to 2 tons. It is installing heavy forging presses and chill casting equipment to make ingots up to 32 in. in diameter. Big hand forgings are needed for prototype parts and short runs, especially for airframe development.

HOT BELT—Better rubber is on the way for conveyors that handle 350° F materials. B. F. Goodrich claims its Solarflex is better for mechanical belt splices which usually pull out of inferior or less heat resistant materials.

CONTENDER—Silicon is ready to make its bid in the transistor market. Germanium Products Corp. of Paterson, N. J. (Bogue Electric Mfg. Co. subsidiary) is geared to produce 10,000 silicon transistors a day. Big advantage over germanium is their ability to withstand high heat—they can be used without bulky cooling equipment.

BLAST FURNACE BLOWER—First user of the integral air head on the governor for the outside control of steam turbines which drive a blast furnace: The Buffalo mill of the Wickwire Spencer Steel Division, Colorado Fuel & Iron Corp. The centrifugal air blower replaces a much larger unit which was driven by a reciprocating engine. It dates back to 1907. The blower was made by Allis-Chalmers. The 6020-hp turbine was fabricated by Worthington Corp.

HIRE HAMS—Need satisfactory electronics maintenance men? Look for people with ham radio experience, advises Acme Aluminum Alloys, Dayton, O., which is making electronically controlled machinery.

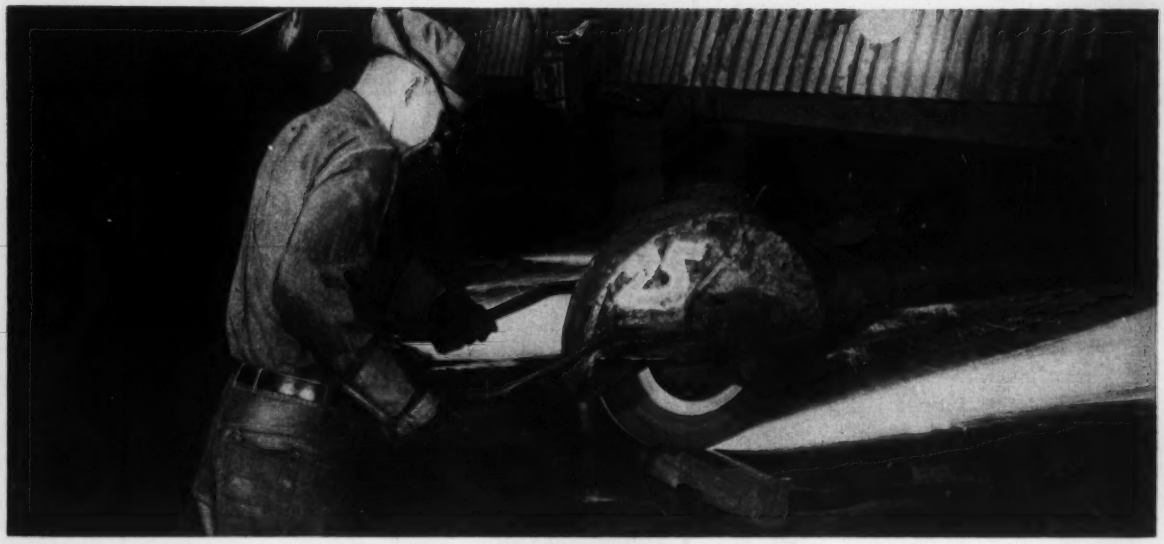
HOT RUN—In France, hot ingots are being transported from steelworks to foundry by rail as far as 17 miles. Ingots are cradled in a covered gondola car and are insulated with loose vermiculite. The rail run (handled as regular traffic) takes 5 hours, during which the ingots lose only about 100° F from a starting temperature of 1380° F.

ANTISTICK STUCK—Teflon, the resin that won't stick to anything, will if you want it to now. Du Pont will supply the method.

TIMING THE ATOM—The world's fastest electric stop watch is the claim for Westinghouse's latest development. It can measure the time it takes light to travel 3 in. or the speed of a neutron smashing into an atom. Exact top speed (predicted to be ten times faster than a billionth of a second) hasn't been determined.

BASKET CAR—The Nickel Plate Railroad has equipped a flatcar to transport large woven wire shop containers—something worth looking into if that's the way you handle bulk castings and forgings.

Metalworking Outlook—p. 69 *Market Outlook—p. 161*



Nomograph for Grinding Costs

By WILLIAM G. SLACK
Billet Conditioning Department Head
Crucible Steel Co. of America
Syracuse, N. Y.
and
JAMES T. ZAWODNI
Vice President
Acme Abrasive Co.
Center Line, Mich.

HERE'S A NOMOGRAPH to make life easier for the grinding room supervisor when the cost accounting department breathes down his neck. This timesaver had two years of tryout at the Billet Conditioning Department of Crucible Steel Co. of America's Sanderson-Halcomb Works.

It is used to make a constant check on the grinding cost per billet ton, or the cost per pound of metal removed. Crucible checks an average of 16 snagging wheels out of each 100 used. Direct reading from a chart replaces the labor and monotony of repeating the calculations shown on the upper nomograph (right).

Do It Yourself—The nomographs here are samples only, but you can easily make your own to fit your needs. One nomograph can be made to serve several sizes or costs of wheels; you'll need to make a new one only when overhead or labor costs change.

The larger you make the nomograph, the easier it will be to calibrate and read. Crucible reads to the nearest 25 cents.

It's possible that this idea can be adapted to other uses, such as figuring costs on welding rods, tumbling and blasting abrasives, and coating materials.

Here's How—To put costs under a common denominator, wheel cost is expressed in terms of labor and overhead costs. Before grinding is started, a $15 wheel is equivalent to 3 hours of labor and overhead at $5 an hour. The relationship of total costs to hours of wheel life is expressed in the column labeled "nomograph life."

The nomograph has three scales: A. Grinding life—total cost, read top to bottom. B. Tons or pounds ground, read bottom to top. C. Cost per ton ground, or cost per pound of metal removed, read on diagonals connecting the first two scales. Divisions of the C scales are derived from the A and B scales.

Scale Away—Length of the parallel A and B scales and their distance apart is purely arbitrary. They are divided into equal parts. A few extra divisions on the A scale allow for initial wheel cost.

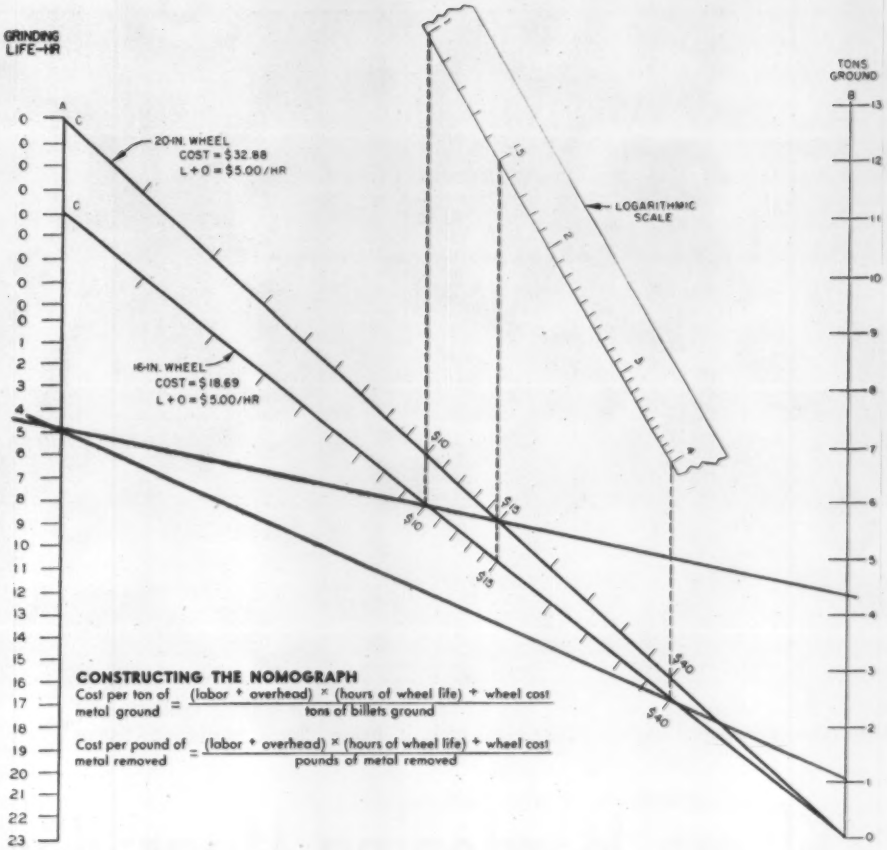
To calibrate the diagonal C scale, let's pick a 16-in. wheel costing $18.69, with labor and overhead at $5 an hour. In 5 grinding hours, the total cost is $43.69. Dividing the total cost by some even dollar figure (say $10 per ton), we get 4.37 tons. Connect 5 hours on the A scale by a straight line with 4.37 tons on the B scale, and label the point $10 where the line crosses the C scale.

Log Help—You can calculate all the divisions on the C scale this way. This is a logarithmic scale. Once you have established two points you can project the others from a slide rule or piece of logarithmic graph paper (see illustration).

Calibrations on one C scale serve for all C scales, since equal costs lie directly above one another (i.e., parallel to the A and B scales) on each of the C scales.

• *Extra copies of this article are available in quantities from one to three until supply is exhausted. Write Editorial Service, STEEL, Penton Bldg., Cleveland 13, O.*

TOTAL COST 16 in.	NOMO. LIFE-HR 16 in.	TOTAL COST 20 in.	NOMO. LIFE-HR 20 in.	GRINDING LIFE-HR
0	0	0	0	0
		5	1	0
		10	2	0
0	0	15	3	0
5	1	20	4	0
10	2	25	5	0
15	3	30	6	0
18.69	3.74	32.88	6.58	0
23.69	4.74	37.88	7.58	1
28.69	5.74	42.88	8.58	2
33.69	6.74	47.88	9.58	3
38.69	7.74	52.88	10.58	4
43.69	8.74	57.88	11.58	5
48.69	9.74	62.88	12.58	6
53.69	10.74	67.88	13.58	7
58.69	11.74	72.88	14.58	8
63.69	12.74	77.88	15.58	9
68.69	13.74	82.88	16.58	10
73.69	14.74	87.88	17.58	11
78.69	15.74	92.88	18.58	12
83.69	16.74	97.88	19.58	13
88.69	17.74	102.88	20.58	14
93.69	18.74	107.88	21.58	15
98.69	19.74	112.88	22.58	16
103.69	20.74	117.88	23.58	17
108.69	21.74	122.88	24.58	18
113.69	22.74	127.88	25.58	19
118.69	23.74	132.88	26.58	20
123.69	24.74	137.88	27.58	21
128.69	25.74	142.88	28.58	22
133.69	26.74	147.88	29.58	23

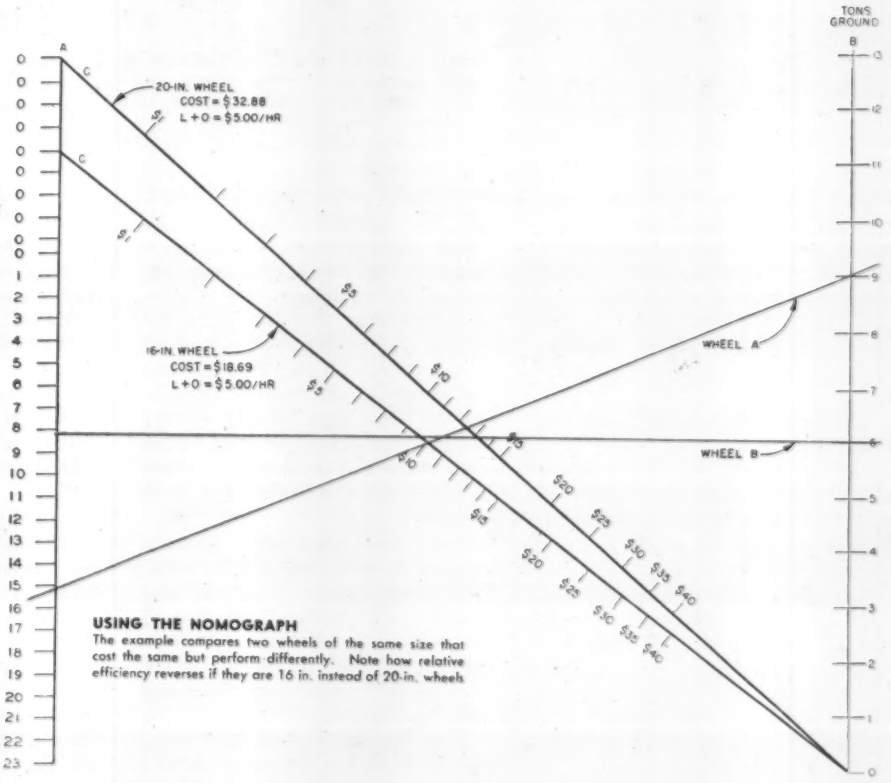


CONSTRUCTING THE NOMOGRAPH

Cost per ton of metal ground = $\frac{(\text{labor} + \text{overhead}) \times (\text{hours of wheel life}) + \text{wheel cost}}{\text{tons of billets ground}}$

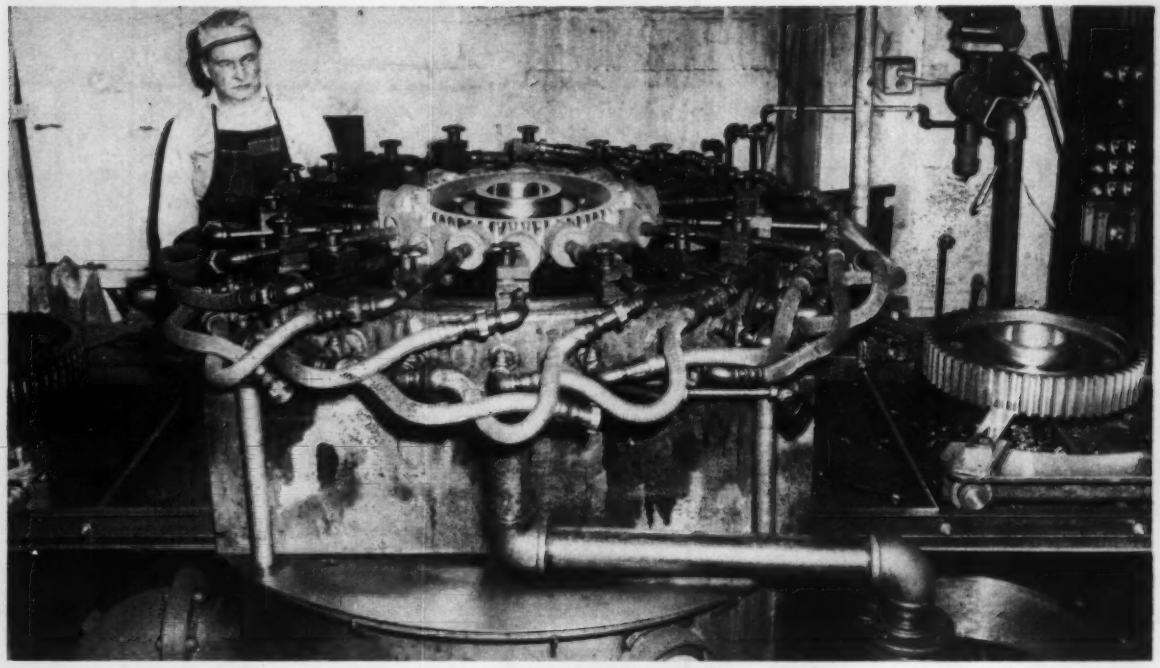
Cost per pound of metal removed = $\frac{(\text{labor} + \text{overhead}) \times (\text{hours of wheel life}) + \text{wheel cost}}{\text{pounds of metal removed}}$

TOTAL COST 16 in.	NOMO. LIFE-HR 16 in.	TOTAL COST 20 in.	NOMO. LIFE-HR 20 in.	GRINDING LIFE-HR
0	0	0	0	0
		5	1	0
		10	2	0
0	0	15	3	0
5	1	20	4	0
10	2	25	5	0
15	3	30	6	0
18.69	3.74	32.88	6.58	0
23.69	4.74	37.88	7.58	1
28.69	5.74	42.88	8.58	2
33.69	6.74	47.88	9.58	3
38.69	7.74	52.88	10.58	4
43.69	8.74	57.88	11.58	5
48.69	9.74	62.88	12.58	6
53.69	10.74	67.88	13.58	7
58.69	11.74	72.88	14.58	8
63.69	12.74	77.88	15.58	9
68.69	13.74	82.88	16.58	10
73.69	14.74	87.88	17.58	11
78.69	15.74	92.88	18.58	12
83.69	16.74	97.88	19.58	13
88.69	17.74	102.88	20.58	14
93.69	18.74	107.88	21.58	15
98.69	19.74	112.88	22.58	16
103.69	20.74	117.88	23.58	17
108.69	21.74	122.88	24.58	18
113.69	22.74	127.88	25.58	19
118.69	23.74	132.88	26.58	20
123.69	24.74	137.88	27.58	21
128.69	25.74	142.88	28.58	22
133.69	26.74	147.88	29.58	23



USING THE NOMOGRAPH

The example compares two wheels of the same size that cost the same but perform differently. Note how relative efficiency reverses if they are 16 in. instead of 20-in. wheels



Gas-air flame hardening unit. Gears can be seen on dollies at loading station (right) and unloading station (left). Quenching tank is below flame hardening fixture

Flame Hardening Upgrades Gears

By JAMES P. BATES and C. A. TURNER JR.

Chief Metallurgist
Hyster Co.
Portland, Oreg.

Chief Metallurgist
Selas Corp. of America
Philadelphia

WHEN Hyster Co., Portland, Oreg., switched to gas-air flame hardening to heat treat the large gears for its tractor-mounted towing winches, it gained in six ways:

1. Controlled heat input makes for a uniform hardness pattern, from tooth to tooth and gear to gear.

2. C1046 carbon steel takes the place of alloy steel.

3. Gear blanks can be machined in the normalized and tempered condition (Bhn 180-220), resulting in a 27-per-cent reduction in overall machining time.

4. Strength, wear resistance and toughness are improved, permitting up to a 20-per-cent reduction in gear face widths.

5. Localized heating and hardening to a limited depth below the gear teeth permits finish machining of the bore and reaming of dowel holes after heat treatment.

6. The operation is economical.

Does Job—Hyster Co. makes a complete line of towing winches and allied equipment for Caterpillar tractors. As Caterpillar increased the horsepower output of its equipment, Hyster matched the new requirements without increasing the size and weight of the winches. Flame heat treating of the large drum and intermediate gears increased their strength and wear resistance.

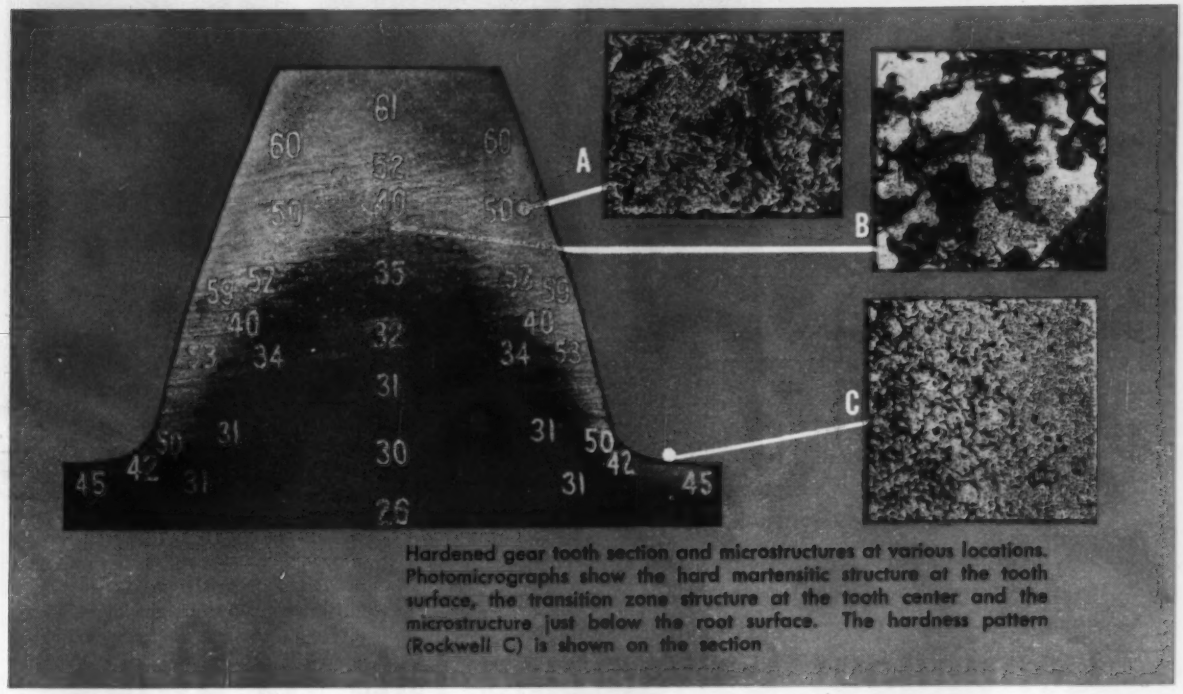
Gears had been made from a manganese-molybdenum alloy steel. They were heated, quenched and tempered to a uniform hardness of Rockwell C 24-30, then machined. Increasing the hardness would have made machining time and costs prohibitive.

After laboratory and field tests, Hyster installed gas-air burners made by Selas Corp. of America, Philadelphia. They did the job.

Equipment — The Duradiant burners are essentially molded refractory cups. Rapid combustion of premixed gas and air occurs within the confined cavity of the burner cup. Radiation from the incandescent ceramic cup surface and convected heat of the hot gases provide a rapid heat transfer rate without flame impingement.

Up to 24 burners can be connected by flexible metallic hose to the circular manifold. Adding and removing burners permits flame hardening of gears from 8 to 30 in. in diameter, with face widths of 1½ to 5 in.

Procedure—A gear to be treated is placed on the charging dolly which is positioned to center over the work spindle. The rotating spindle raises the gear into position



Hardened gear tooth section and microstructures at various locations. Photomicrographs show the hard martensitic structure at the tooth surface, the transition zone structure at the tooth center and the microstructure just below the root surface. The hardness pattern (Rockwell C) is shown on the section

within the ring of burners. At the end of the heating cycle the gear is lowered (in less than 3 seconds) to the oil quench where it centers and rotates within a submerged spray ring. Oil under 50-psi pressure is directed through holes (1 1/16-in. in diameter) to impinge on the gear face. After quenching, the gear is raised and is picked up by the discharge dolly. The heating and quenching operation is automatic. Electric timers control the preselected cycle.

Hardness Pattern—The tooth hardness pattern produced by flame hardening a drum gear is shown in the structural study. Wear surfaces of the tooth have maximum hardness. The core, at Rc40 hardness, will resist impact loading.

The root of the teeth is hardened to a shallow depth to prevent failure by bending fatigue at the fillet surface.

Controlled Hardening — Distortion is minimized by controlling the heat to limit hardening to the critical tooth and root surface areas. For drum gears (about 22 in. in diameter), shrinkage is 0.010 to 0.015-in. on the OD and taper on the face is 0.003 to 0.005-in. Operations before flame hardening are: Turn, face, bore, hob and drill. About 1/32-in. of stock is left on counterbore face to take care of any movement during heat treatment. After tempering, the operations are: Blast clean, rebore and face, ream, tap, burr and inspect.

Intermediate gears (about 16 in. in diameter) shrink 0.004 to 0.008-in. on the OD and taper is 0.001 to 0.002-in.

New Setup—When setting up for flame hardening a new gear, the heating time is first determined by an optical pyrometer, and the quenching time by trial. Production runs are made on an automatically timed cycle. Tooth hardness pattern is checked on each new gear design to be flame hardened. For this purpose, a three-tooth pie section is removed from an untreated, scrapped gear and clamped into a matching cutout section of another finished gear. After flame hardening on the established production run for this gear, the pie section is removed and the center tooth cut out. After sectioning, polishing and etching, a hardness survey is made and the pattern is determined.

This flame hardening unit has been in operation over two years, heat treating 14 different size gears. There is no record of a worn out or broken gear.

Typical Flame-Hardened Gears

	Drum Gear	Intermediate Gear
OD, in.	21.83	16.00
ID of rim, in.	18.63	13.00
Diametral pitch	2.5:3	2.5:3
Number of teeth	53	39
Face width, in.	4.0	2.25
Weight of rim, lb	91	30
Gear weight, lb	160	65
Number of burners	20	16
Heating time, minutes	6.75	4.60
Floor-to-floor time, minutes	10	8.00
Fuel cost per gear, cents	19.2	13.9

Improved ductility of the coating permits heavy forming operations without destroying corrosion-stopping qualities

All these products have been formed from continuous galvanized sheets

Continuous Galvanizing Hits Its Stride

By ERNEST W. HORVICK
American Zinc Institute
New York

CONTINUOUS galvanizing lines have created a new demand for zinc-coated steel strip and sheets. Both products are fulfilling requirements for many manufacturing operations that previously were not economical. As a result, a host of new products is on the market. . . products that require the strength of steel and the rust protection of zinc.

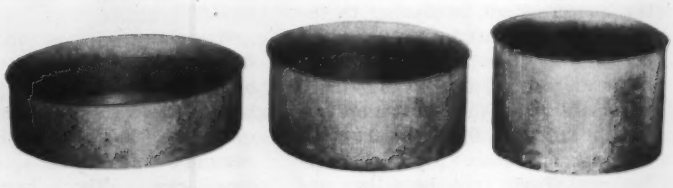
The trend toward greater use of steel has been mainly in sheet and strip steel. Their increase has been over 65 per cent since 1940. There are indications that the market for steel protected with zinc coatings has advanced even more rapidly than the general use of sheet and strip steel.

Product Improvements—The adherence and ductility of the zinc coating have been improved to such an extent that only the base metal controls the limits of bending, forming and stamping. A tight, malleable bond between the zinc and steel allows the sheet to undergo severe deformation.

Galvanized steel can be deep drawn, spun, hemmed, fringed, lock formed and crimped without peeling or flaking. The zinc coating on the finished product remains as continuous as it was before forming and maintains the corrosion resistance imparted to the flat stock. Under deformation, the zinc coating elongates and flows evenly with the base metal, so that it can be drawn and formed to the full ductility of the base metal.

Here's Why—The tenacious adherence and high ductility of the zinc coating stem from the large reduction of the mass of zinc-alloy layers between the coating and steel. Alloy layers formed from the zinc-iron reaction are brittle intermetallic compounds, harder than the zinc or base metal. If present

In successive draws, this 11¼-in. (diameter) x 10½-in. (deep) container was formed from a blank 26 ⅛-in. in diameter. There were no breaks in the coating



in a layer of significant thickness, they would fracture. The zinc coating would fail on deformation.

Continuous line galvanized steel has only a thin uniform alloy layer. Because of conditions inherent in the continuous process, the coating consists of highly ductile zinc. Reason: Its dross content is low.

Cost Saving Factors—The continuous process produces more tons per man-hour than the old conventional process. Large savings are effected in reduction or elimination of intermittent handling because of continuity of operation from unit to unit of the interlocked system. In some applications, costs for melting the zinc are lowered, since the heat in the strip steel keeps the bath molten.

Because of the speed of operation and other processing factors, zinc loss through dross formation is lowered considerably, resulting in substantial dollar savings.

Uniformity Plus—The uniform coating of the continuous process sheet is an important cost saving factor in handling and processing. Control of coating eliminates variations of thickness and drip ends where the coating is many times thicker than on any other portion of the sheet. Drip ends cause difficulty in piling and bundling sheets in the flat. They cause "sticking" in rolling and die forming operations. The added thickness creates interference at fits, as between pipes and elbows, gutters and miters, and other places where pieces are joined.

Uniform coating afforded by the continuous process permits a less expensive small package for a given size and number of sheets, less tendency for sheets to jam in dies and machines and better size uniformity in parts made by rolling, forming, drawing and stamping.

These Are the Major Markets

APPLIANCES—Dishwashers, automatic washers, home freezers, room coolers, dehumidifiers, clothes dryer drums, coil plates for refrigerators, electric iron covers and radio chassis are but a few of the domestic items that represent large new markets.

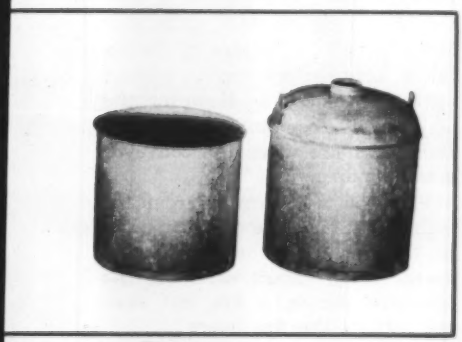
AGRICULTURE—New types of barnyard equipment, poultry and stock feeders, watering vessels, harvesting equipment, feed cookers, processing equipment, corn pickers, ensilage cutters, currycombs, grain drills, hoppers and tubes, incubator trays, sprayer bodies, feed grinder hoppers, sprayer heads, orchard heaters, steel baskets for fruits, vegetables and eggs, milk crates, grain bins and grain sieves for combines are only a few of the items.

CONSTRUCTION—Metal lath, corner bead, steel stud, casings, screen, metal trim and new and improved types of rain carrying equipment, such as pipe and troughs. Elbows and other fittings, furnace pipe and fittings, smoke pipe and elbows, roof and louver ventilators.

AUTOMOTIVE—New products in the automotive field include air filters, automobile hardware, exhaust shields, hub cap liners, radiator shells, scuff plates and upholstery molding.

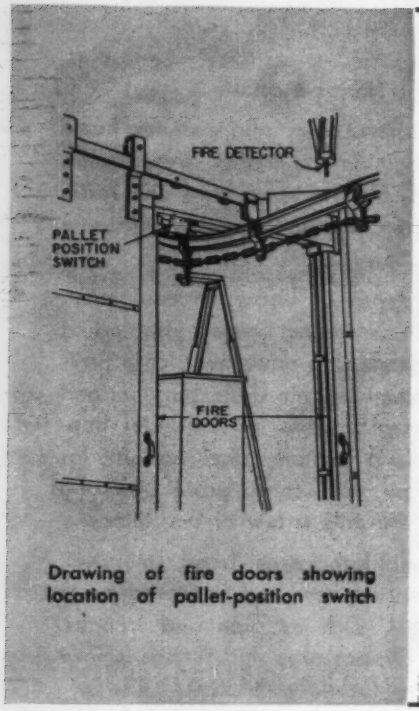
CONTAINERS—In addition to conventional containers, new types include fire extinguishers, ice bag bottoms, box corners, crate corners and braces, fishing tackle boxes, grease receptacles, drums, tool boxes, gasoline cars, turpentine cups and milk crates.

INDUSTRIAL EQUIPMENT — Continuous galvanized products are used in the manufacture of boxcar roofs, panels and trusses, ducts for carrying off dust and fumes, meter boxes, panels for conveyors, pulley wheels, reflectors, switch boxes and covers, heavy drums, storage tanks, motor and transformer casings and well casings.

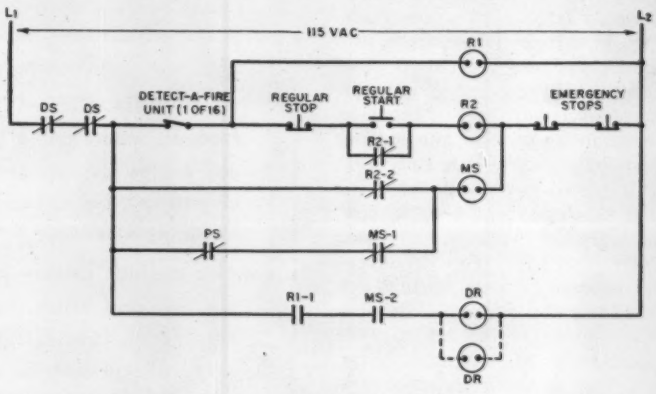


Coil Savings — Continuous galvanized steel brings about lower manufacturing costs because of the economies made possible by coils. Operations can be carried out continuously and progressively, making for more rapid production. The same power, die metal and drawing rings employed for drawing steels can be used satisfactorily. The design and layout for many parts can be simplified.

Scrap loss can be minimized; stock for items can be cut to exact lengths as needed. The manufacture of certain articles (such as large stock tanks) from galvanized coils, permits layout of blanks in mesh so that practically all the strip is used. The number of seams for making leakproof joints are reduced, so that fabrication time is cut and product quality improved.



Drawing of fire doors showing location of pallet-position switch



R1—Control relay

R1-1—Contacts of relay R1 (normally closed)

R2—Control relay

R2-1 & R2-2—Contacts of relay R2 (normally open)

MS—Conveyor motor starter relay

MS-1 & MS-2—Contacts of starter relay (normally open and normally closed)

DS—Door-position switch (open when doors close)

PS—Pallet-position switch (closed unless tripped by pallet)

DR—Door-release solenoid

Circuits for the detectors, door-closing and motor controls. All elements shown with conveyor running

Fire Door Closing System Is Collision-Proof

THE TROLLEY conveyor line in the finishing department at the R-Way Furniture Co., Sheboygan, Wis., is several thousand feet long. At one point it rises from the first to the fourth floor through a long inclined tunnel that could create a dangerous updraft in a fire.

To eliminate this, a pair of sliding fire doors is installed at the entrance to the tunnel. The door-closing mechanism must do two jobs: 1. Close the doors automatically but time the closing to avoid collision with a pallet on the conveyor. 2. Shut off the conveyor as soon as the doors start to close.

The System—R-Way devised a door-release system that is actuated by fire detectors and electrically interlocked with the conveyor drive motor. Sixteen fire detector units, set to actuate at 160°F, are installed at several points in the plant.

When a detector senses an abnormal temperature condition, it closes one of two sets of relay contacts wired in series to the door-release mechanism. The second set of relay contacts is controlled by a pallet-position switch mounted on the conveyor rail just beyond the doorway. This switch keeps the door release de-activated until the doorway is clear.

How It Works — Pallets are mounted on 6-ft centers on the conveyor. As the oncoming pallet clears the doorway, it trips the pallet-position switch, energizing the second relay controlling the door release. The door-holding solenoids then release the doors which slide shut by gravity.

Simultaneously, the pallet switch de-energizes the power relay for the conveyor motor, stopping the conveyor before another pallet reaches the doorway. A pair of normally open switches on the doors prevents the conveyor from being started unless the doors are fully open.

Detectors—The Fenwal Detect-A-Fire units consist basically of a tubular outer shell (temperature sensing element) made of a high-expanding metal and an internal bowed strut assembly made of a low-expanding metal. Contact points are mounted on the internal struts. As the outer shell expands longitudinally, the contact points come together, closing the electrical circuit. The detectors are self-resetting.

Practical—The door-closing system allows the conveyor to be shut down because of a jam or during lunch hour or at night, without operating the doors. However, the doors will close automatically if there is a fire when the conveyor is not running.

There is a separate circuit of eight additional fire detector units in the spray booths and drying ovens. This circuit shuts off the conveyor during a fire but does not actuate the fire doors.

"...now what about the service?"

We strive to give the utmost service to our customers. That, like Alan Wood quality control, is a basic advantage in buying A.W. Cold Rolled Sheet and Strip.

When problems arise as to the correct temper or finish to use, call on our metallurgists for assistance. They've helped our customers with hundreds of production problems and are always on call. It's part of our normal service.

We're a completely integrated mill and have close departmental contact. We keep close tabs on your order, in the mill and in the office. We make it a personal issue to see that your requirements are met.

In short—your order gets the individual attention required for dependable service. For your cold rolled sheet and strip requirements, look to Alan Wood. Additional information available on request.

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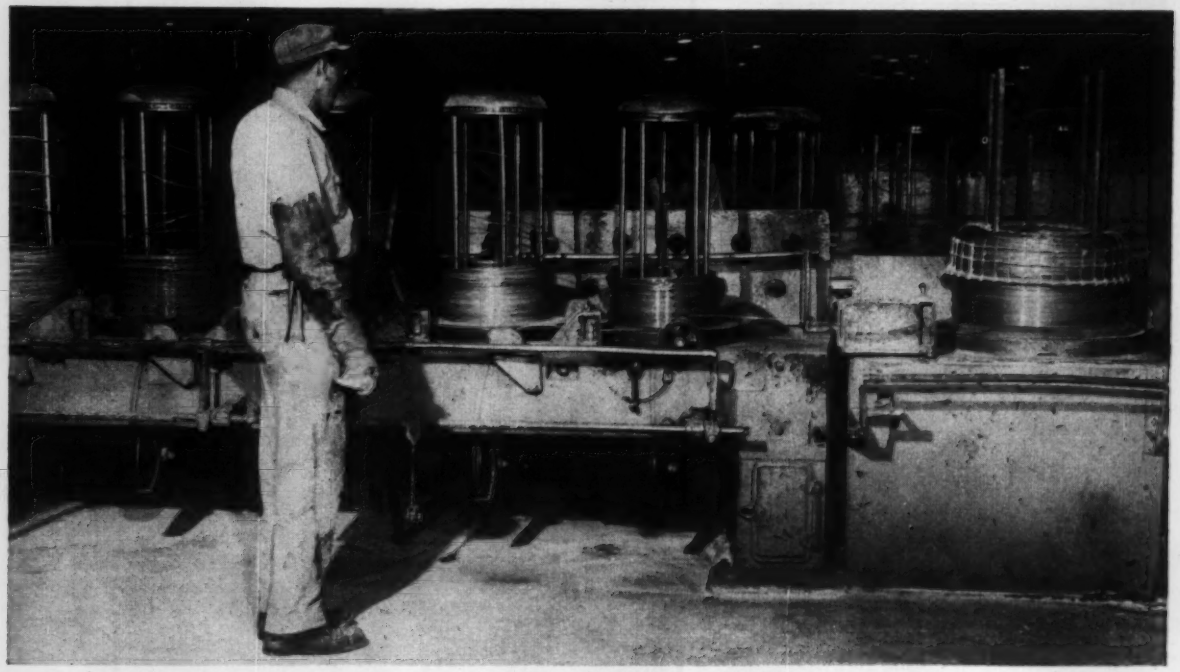

Old-style drawing machine with added monoblock (right) doesn't have to be stopped for restringing

Five Ways To Stretch Wire Production

Think about new equipment after you find out how well you're doing with the old, the author advised at the San Francisco meeting of the American Iron & Steel Institute

By CHARLES C. TAPPERO
Superintendent of Wire Mills
Colorado Fuel & Iron Corp.
Pueblo, Colo.

GETTING the most out of wire mill equipment isn't a matter of running it faster. Adding hoists, extra reels, lift trucks and conveyors can increase production when other methods fail.

The Pueblo Works found five, low-cost ways to up production: 1. A monoblock for an old-style drawing machine. 2. A rod flip that helps a wire drawer load three bundles at once. 3. Pegs for take-up blocks and payoff reels to double their capacity. 4. A hoist to double the input load on a nail machine. 5. A larger, fork-truck-size bin to replace a small pan.

Examples—A helper frequently loads a reel with wire when the other machine starts to run out. To prevent damage to the carbide dies, he leaves the first machine, shuts down the second and finishes servicing the first.

Pueblo has a number of old, fixed-speed drawing machines finishing at 870 rpm. The intermediate blocks can't be uncoupled to reduce build-up. After the machine finishes about 1000 lb of wire, build-up on the intermediate block reaches the top. It is then necessary to cut off the rod at the ripper, run out the wire on the intermediates and restring the machine. Lost time adds up to about 5 per cent.

At small cost, we added a 22-in. monoblock. The original finishing block was replaced by an intermediate which feeds the monoblock. Speed of the added block is 1150 rpm, and it continues to draw wire off the last intermediate block after the original machine is shut down. The original machine can be restrung without stopping or losing production. This, plus the higher finishing speed, increased our production 30 per cent (equal to one new machine). The cost of equipping four machines was 25 per cent of the cost of a new unit.

A rod flip should allow the operator to load three bundles of rods. Normally, only two bundles are required for an efficient operation, but the addition of a third bundle gives the operator still more time—time that he can use to watch the

GUNCHROME-M
Because of its chemical bonds, plasticizing agents, and carefully controlled sizing, Gunchrome-M adheres well to hot furnace walls and forms a dense, strong structure similar in composition to chrome-magnesite brick
URNACE MAINTENANCE
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GUNCHROME-M...the chrome-magnesia refractory for quick, hot repair of critical furnace areas

• If you are concerned with furnace operation and maintenance, you'll want to know more about Gunchrome-M.

This unique chrome-magnesia refractory is applied by air emplacement to back walls, skewbacks, front walls, end walls, arches, uptakes, and other critical areas.

Not only is Gunchrome-M an easy effective method of repairing hot furnaces, but it insures:

1—balanced furnace life through maintenance of critical areas. 2—reduced brick replacement at rebuild by periodic maintenance throughout furnace campaign. 3—the ability to meet emergency needs for extending furnace life beyond normal campaign expectancy.

Ask your Basic Sales Engineer for facts and figures on Gunchrome-M as revealed in actual application reports. Or write for Gunchrome-M Bulletin G-101 illustrated above.

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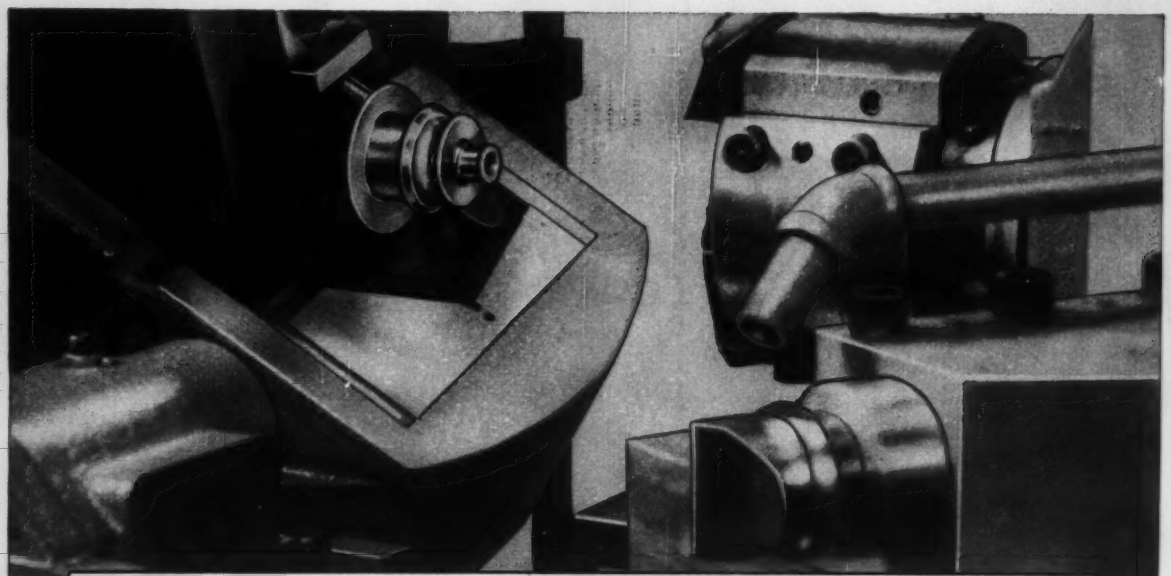

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Automatic Chucking Turret Lathe

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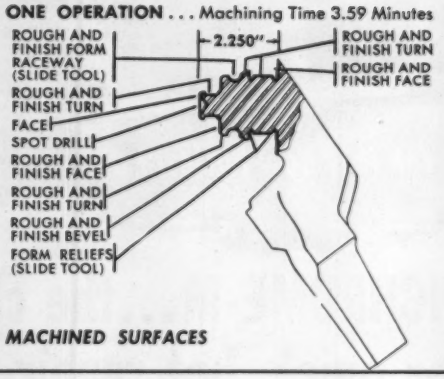
COMPLETED: Quickly, economically in 1 completely automatic cycle!

ONE OPERATION . . . Machining Time 3.59 Minutes



HEAVY LINES INDICATE MACHINED SURFACES

And remember, this is *not* an exceptional, "done-for-the-record" case history. It's a regular production job that typifies the day-in-day-out performance you can count on because a P&J 6DRE-40 has the advanced design, added rigidity, extra speed and power, and versatility to take tough jobs in stride. And when you team this P&J Automatic with tooling engineered by P&J Specialists, you really have a cost cutting, profit building combination.

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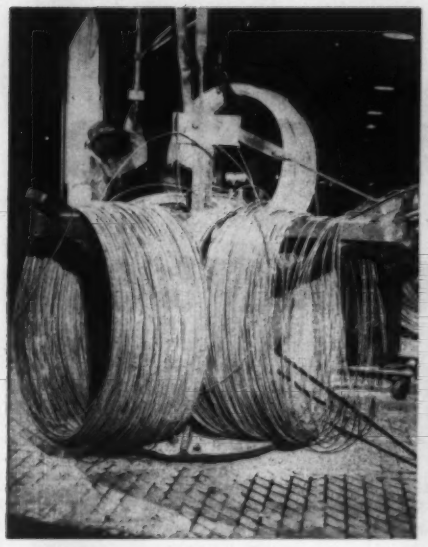


Rod flip for three bundles. Operator cap load and weld in his spare time

Removable pegs on these take-up blocks and payoff reels permit an operator to load a second bundle while the first is still paying out

quality of his work.

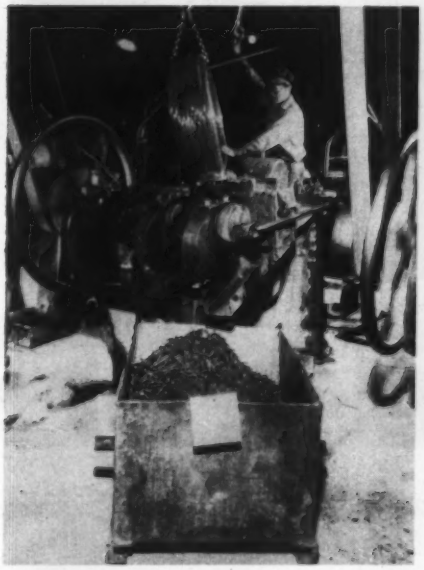
Materials—The floor layout of Pueblo's patenting unit highlights the importance of materials supply. Take-up blocks and payoff reels (above) are adjacent to each other, making it easy for the operator to watch both.

Originally, our reels held only one bundle. We couldn't add more because of floor space. Block efficiency was low, and wires got lost and tangled when reels and blocks required service at the same time. By installing removable pins midway on the reel, a second bundle can be placed even during production. Again, this helps the operator. Time saved is spent keeping rods straight and eliminating tangles.

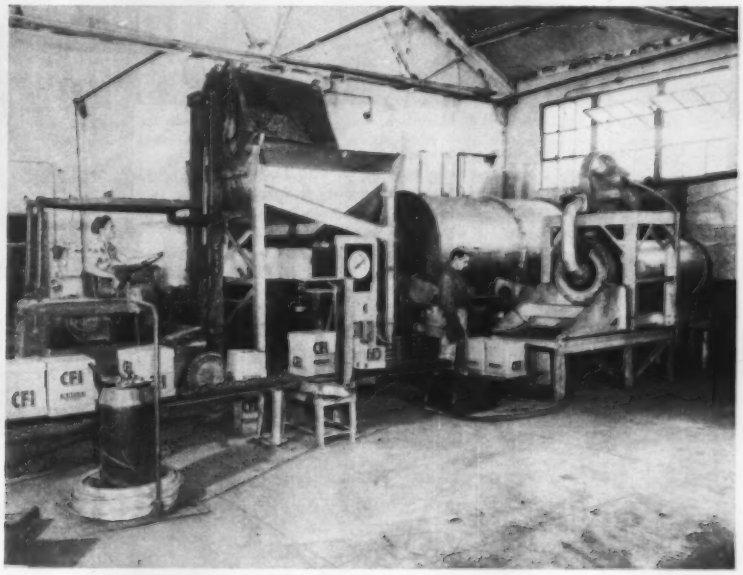
This simple change increased our block efficiency to better than 99 per cent.

Nails—Many old-style nail machines can be improved. We loaded ours manually with 150-to-200-lb bundles. Nails fell from the machine into a small tote box which the helper dumped into a nail buggy.

Adding a hoist permitted doubling the weight of the wire bundle. We designed a tote box large enough for a lift truck to eliminate the hand-dumping operation. Nail machine helpers now service 50 per cent more machines. They have time to check quality and do a



Bigger feeding and receiving units on this nail machine give operator time to check nail quality and lubricate the machine



When you can't get any more out of the old, you may have to get new machinery. This nail bluing equipment takes advantage of layout and automation to reduce operator fatigue and cut labor costs

Republic Stainless cuts cost of

Operator at left is removing scale accumulation from Clepco immersion heater casing made from Republic ELECTRUNITE® Stainless Steel Tubing. Any normal cleaning procedure may be followed without risk of damage to unit. And if your product demands cleanliness, the lustrous, smooth-finished surfaces of stainless tubing are clean, sanitary, and easy to keep that way. Solid stainless throughout, maintenance and replacement costs are reduced.

Operator at right is shaping 2" Republic ELECTRUNITE Stainless Steel Tubing to a bullet nose by spinning it under flame. Workability of this tubing makes it easy to fabricate. For heater casings, Cleveland Process uses both Types 304 and 316 Stainless Tubing which they find highly satisfactory for either acid or alkaline solutions—at temperatures ranging from 100° to 600°.

REPUBLIC

REPUBLIC STEEL

World's Widest Range of Standard Steels

Tubing solves breakage problem...

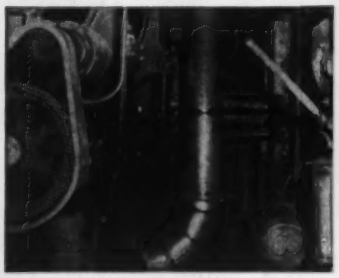
Clepco immersion heater casings

The Cleveland Process Company of Cleveland, Ohio, manufacturers of Clepco immersion heaters, had a twofold problem. The tube-like casings they use to house heating elements were fabricated from a brittle imported material. Scale removal was particularly hazardous—often resulting in a cracked or broken casing. Furthermore, the material itself, although an effective insulation, was expensive.

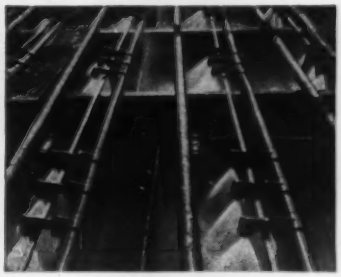
To solve these problems, Cleveland Process switched to Republic ELECTRUNITE Stainless Steel Tubing for heater casings. They found ELECTRUNITE Stainless Tubing easy to fabricate, having consistently uniform diameter, wall thickness, concentricity, strength and ductility. But most important, ELECTRUNITE completely eliminated breakage and substantially reduced material costs.

Made of long-lasting Republic ENDURO Stainless Steel, this tubing provides strong resistance to corrosion, oxidation and scaling at high temperatures. Where strength is a requirement ELECTRUNITE Stainless Tubing is ideal—providing an extremely high strength-to-weight ratio.

This tubing may be the very material you need to improve your product or process. For detailed information about the many cost-saving advantages of Republic ELECTRUNITE Stainless Steel Tubing—including sizes, gages and analyses—send coupon today for new, illustrated 60-page booklet.



REPUBLIC ENDURO® STAINLESS PIPE SAVES COSTS in paper mills. Section shown above is part of a piping system that conveys the highly corrosive pulp mixture to the processing machines. Where corrosion-resistance is vital to cost savings, the extra expense of this long-lasting piping is an inexpensive investment in long-range economy.



REPUBLIC SEMI-RIGID PLASTIC PIPE SAVES COSTS in cooling towers. Original pipe had to be replaced every four months in this cooling installation near coke ovens. A constant bath of corrosive steam saturated with hydrochloric acid soon destroyed it. Two years ago, Republic Semi-Rigid was installed with excellent results: no sign of damage to this date.

REPUBLIC DEKORON®-COATED EMT SAVES COSTS of electrical conduit in chemical plants. Wherever the atmosphere is corrosive, unprotected metal parts take a beating. But Dekoron-Coated EMT shrugs off corrosion. The tough, polyethylene coating over the galvanized finish gives double protection to electrical raceways. Send coupon for facts.

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better job lubricating and checking the machinery.

Bluing—It is possible that you are getting all you can out of your machinery. A study of our old, nail bluing setup showed that there was little that could be done. Still, production needed to be increased.

A new, continuous furnace was purchased and set beside a hopper that is loaded directly by a fork truck. Nails are unloaded by conveyor into a cooling drum, then onto a vibrating packing table and into containers. Full ones are taken to shipping by roller conveyors.

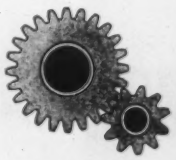
Here, again, our concern for the operator paid off. Heat was greatly reduced by the new equipment and working conditions improved. One man, instead of two, is needed to operate the equipment.

Get as many mechanical aids as possible. Provide hoists, conveyors, larger buckets and lift trucks to help the operator. How far you go depends on how much time and costs are saved.

Maintenance—Repeated mechanical or electrical failures usually can be corrected by a change in design. Often, probably too often, such delays can be eliminated by operating personnel. Better setups improve tool life; an improved lubrication program decreases equipment failures. Materials handling of both raw and finished materials are often overlooked. The purchase of a fork lift or tractor is the equivalent in production of one or more drawing machines, which cost many times as much as a tractor. In fact, the purchase of more drawing machines can mean even greater delay and little or no increase in production.

Size changes are normal operating procedures. Improved scheduling methods reduce change-over delays.

Workload—We have found that delays chargeable to personnel give us the greatest trouble, even though each one is small. Most of them have been caused by a high workload which keeps a man from getting the most out of a machine. Worst offenders are: Operating two or more machines with one man; units that consume several wires at once, like fence or welded fabric machines.



MACHINE TOPICS

A PEACETIME, billion-dollar year for machine tool orders may look like the sonic barrier and the 4-minute mile did a few years ago, but a "breakthrough" could be in the making right now.

Figures of the National Machine Tool Builders' Association show 1955 closed out with a whopping $966.75 million in new orders, a new peacetime peak. The most encouraging part of the story is that the trend line zoomed up in the closing three months, and was still climbing when the year closed. If this improvement continues, and there's some indication it will (STEEL, Jan. 16, p. 37), it will put 1956 past the "billion barrier" with ease.

Shipments in 1955 were only $670.2 million. This contrasts with $891.75 million in 1954.

The drop in shipments reflects the first-of-the-year slump in orders. Builders' estimates for 1956 continue to be optimistic—some talk about hitting the billion mark here, too.

Buick Tricks

Here are three pieces of new equipment that are off the tourists' path at Buick's Flint plant: Spline rollers, a piston checker and an assembly press.

The spline roller marks Buick's entry into the formed-spline business. Ford was first with this one.

Splines come to the rollers (built by Michigan Tool Co.) already hardened. Ends are turned to within 0.002-in. on a Sundstrand lathe. Shafts are SAE 1331 steel forgings.

The splines, with strength extras of cold-formed parts, are rolled to a 1.417 OD. Output on the new set of machines is 200 shafts an hour. Cut splines used to be turned out at 90 an hour.

Assembly — A Buick-built press forces oil-pump gears on shafts at the rate of 400 assemblies an hour. Shafts drop through a chute at the rear of the machine; gears slide in from the front. A pneumatic piston picks up the gears and slides them on.

In the same engine plant, a new piston-fixer weighs, corrects and rechecks 600 aluminum pistons an hour. Built by Morris Machine Tool Co., the machine picks pistons off a conveyor and moves them to an index table where they're positioned by an electric eye that sights through the wristpin holes.

Pistons then move onto a scale that presets a cutting head so it takes the right amount of metal off a weight boss. After machining, pistons are weighed again, and if the weight is out of tolerance, the machine stops.

G & L Reorganized

Giddings & Lewis Machine Tool Co. has been reorganized to get the advantages of a large corporation without giving up the benefits of small-plant operations, says President Ralph J. Kraut. The four main branches of the company have been made divisions, with headquarters still in Fond du Lac, Wis.

The four divisions are: G & L and Hypro, Cincinnati Bickford, Kaukauna Machine & Foundry and Davis Boring Tool (see page 97).

IF YOU MAKE *Springs*

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ROEBLING makes high carbon steel spring wire and flat spring steel... and makes it *better*... for every sort of spring and for every product that requires spring characteristics. Hard drawn, hard rolled, annealed or soft, tempered or untempered ... they're all available to meet your requirements exactly.

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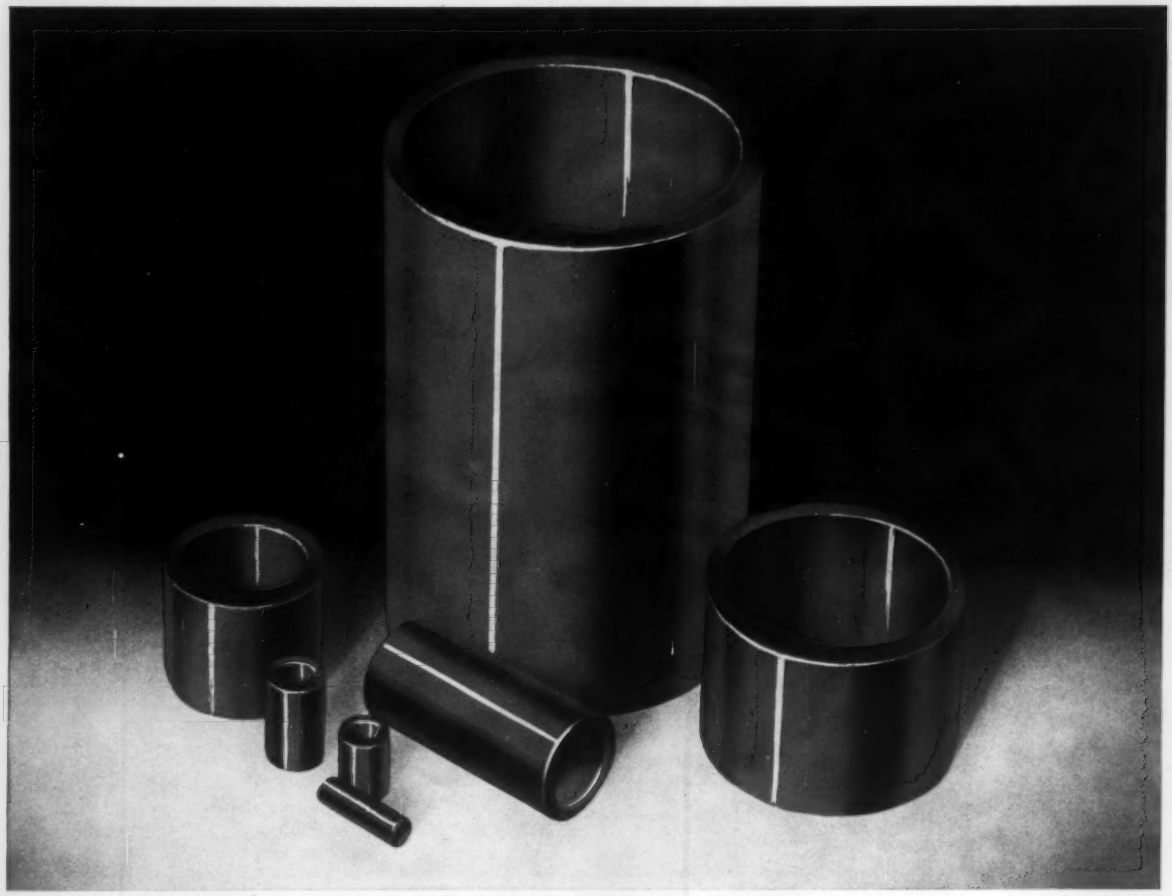

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Your Savings Are Big

with Johnson Standard Sleeve Bearings

Your opportunities for substantial savings are BIG when you include Johnson standard sleeve bearings in your plans for manufacturing new equipment. They are made in volume from general purpose alloy and you can get them quickly from large stocks maintained by Johnson distributors everywhere. You pay no tool and die charges when you use standard bearings. The economy of producing and shipping them is passed along to you. In addition, the savings in time made possible by having stocks available often mean you can go into production faster.

Your design is not limited with Johnson standard sleeve bearings, for they are made in over 900 sizes—more than 200 combinations—inside diameters range from $\frac{1}{4}''$ to $4\frac{1}{2}''$, will fit 47 different shafts—outside diameters range from $\frac{3}{8}''$ to $5''$ and will fit 204 different housings—lengths range from $\frac{5}{8}''$ to $9\frac{3}{4}''$. The alloy is Johnson 72 (SAE 660) which was selected to give the greatest resistance to wear and pounding with minimum reduction in plasticity value. These standard bearings may be altered quickly and economically with oil holes, slots and grooves—even flanged, where it is necessary to overcome thrust.

Johnson is also a prime source for Universal bronze bars, Ledaloyl powder metallurgy bearings, electric motor bearings, and graphited bearings which are available in a wide range of sizes from stock.

For information on how you can enjoy the economy of Johnson standard sleeve bearings, ask your distributor or write for bulletin which contains a chart giving details of size range and data on other stock bars and bearings. Johnson Bronze Co., 550 S. Mill St., New Castle, Pa.

Johnson Bearings

Sleeve Bearing Headquarters

Diecasting a Meter

New gasoline pump meter has 12 diecastings which use three different metals

DIECASTINGS of aluminum, zinc and bronze go into the new PM-2, a gasoline pump meter developed by A. O. Smith Corp., Los Angeles.

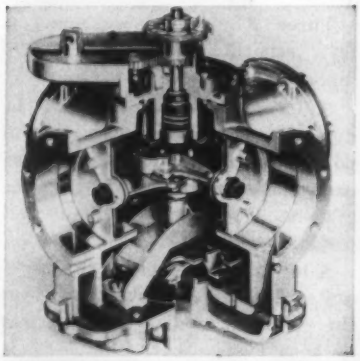
The meter housing is diecast in aluminum as one piece. The die has eight moving side cores; four are actuated by hydraulic side pulls, the other four by angle pulls. The ejector side of the die is made up of side cores which are pulled away from the casting when the die is opened.

For Pistons—Six major openings—one on each of four sides for piston cylinders and one on top and bottom—are formed by the cores. Holes for mounting components and covers also are cored.

On top of the housing is a gear assembly whose housing is diecast aluminum, as are the meter's spider and two yokes. Two hard rolled stainless facings are cast in each yoke to form bearing surfaces.

Cast to Fit — Zinc diecastings form six parts of the meter—four pistons and two gears. No machining is required on the pistons. They run in a stainless steel liner, with leather cup packings providing the seal. The two diecast gears drive the indicating counters. Cast into the gears are oilite bronze bushings.

Abrasion - resistant manganese bronze forms the meter's valve. The valve is self-lapping.



Cutaway view of meter shows diecast aluminum housing, bridge, gear housing and connecting rods; diecast zinc gears and pistons; self-lapping diecast manganese-bronze valve (bottom, under bridge)

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Complete photo of the muscle man appears on the front cover of the February "NELWELDER", industry's magazine of stud welding.

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NELSON STUD WELDING

Division of Gregory Industries, Inc.

LORAIN, OHIO

High-grade iron ore for the sintering plant flows from the scale recovery unit at Armco Steel Corp.'s Middletown, O. Division

Dollars Down the Drain

Our management has changed the definition of "sewer" from "a place to get rid of something" to "a place where you cannot get rid of anything."

Delco-Remy engineer

Industry . . . will hopefully look to the prospects of profitable by-product recovery from wastes, and has already accomplished much in this regard. Yet it is safer to concede that trade-waste treatment may in most cases prove to be an expense unavoidable to manufacturing, and a necessary item in the cost of production.

George E. Barnes
Head of the Department of Civil Engineering and Engineering Mechanics
Case Institute of Technology

THE PLATING ROOM foreman pulls the plug on a worn-out bath and hurries home with his fingers crossed. If the sewer commissioner comes next morning with fire in his eyes, the foreman might:

1. Claim he didn't know he was breaking an ordinance.
2. Claim he had no idea his act would disrupt operation of the sewage disposal plant.
3. Claim there was nothing else to do with the stuff.
4. Claim it costs too much to neutralize or reclaim the chemicals.
5. Claim a disposal unit is in the planning stage.
6. Claim it was all a mistake and won't happen again.

But it will.

Dilemma—Whatever he says, he's voicing industry's predicament over waste. Industry would like nothing better than to eliminate what goes up in smoke, into the dump or down the drain, but too often the cost of ideal waste control (properly a production cost) is forgotten when product prices are set. Then the pressure is on to get rid of waste in the cheapest way, ethical or not.

There's a better way. It hinges on the idea that what looks easiest and cheapest may not be. It considers tomorrow as well as today. It starts with knowing what your wastes really are.

Three Kinds—For convenience, let's separate them into solids, liquids and gases.

Solid wastes that have to be dumped are probably only a temporary problem. There's a good chance that research will produce a demand for drug-on-the-market solids.

A lot of waste goes up the chimney, often to be distributed over the neighborhood. You see less of that every year. Industry is doing a tremendous smoke-abatement job—so good that on a smoggy day the accusing finger now points at the automobile exhaust pipe.

Going—Those are waste problems on the way out. Let's go down into the sewer for a look at one that's still here. Half of what you see flowing by comes from industry. In this country, industry's sewage is equivalent to domestic pollution of 100-million people. Metalworking, the largest industry, contributes heavily.

Domestic sewage, by comparison, is simple. Sedimentation and biological action will clean it up neatly. That is the principle employed in most city sewage plants.

Ugh—Metalworking's sewage is different. It grabs up the air, stifles or poisons the microscopic life that breaks down domestic sewage, creates scums, slicks and deposits that gum up the treatment works and eat out the sewers. It makes an expensive mess to clean up.

Years ago it was popular to dump everything into the nearest watercourse (too many municipal and industrial sewers still do). A running stream shows a remarkable capacity to dispose of waste, but people downstream don't care for what remains. When industrial products like cyanide get into the drinking water, the social and legal consequences are frightening.

Regulation — Thoughtless overburdening of the streams has brought a rash of pollution control laws, some commendable, but many made in anger and ill advised. Where industry has failed to control itself, controls have been imposed from without that limit the exercise of good engineering judgment.

A certain amount of injustice rides along with the cleanup. While coke plants spend millions to keep the last drop of phenol out of the river, coal mines continue to flush out sulphuric acid by the ton. No one knows how to plug the abandoned coal mines.

Guideposts—Out of efforts to encourage and enforce waste control, a few generally accepted principles have emerged:

1. The capacity of a stream to assimilate waste is measurable and should be employed.

2. The dumping of substances which the stream cannot assimilate is intolerable. Such substances include those that are insoluble, vile tasting, or poisonous.

3. Authorities, including local and state governments and regional water commissions, can regulate and enforce the kind and quantity of wastes entering streams, and can prohibit the dis-

Typical Metalworking Wastes

Waste	Effect	Popular Treatments	Purpose
Pickling liquors	May coagulate or precipitate other substances causing high turbidity or sludge deposits. Inhibit biological processes. May damage structures by corrosion and solution	Neutralization and precipitation	Counteract acidity and remove iron salts which may be recovered
Alkalies	Inhibit sewage treatment and stream purification. Kill fish	Neutralization and precipitation	Counteract alkalinity
Oils and greases	Unsightly when floating and harmful to fish and water-fowl. Interfere with normal oxidation	Emulsion breaking, flotation and skimming	Remove oil which may be reclaimed
Phenols	Grab oxygen and create vile tastes in water	Oxidation	Destruction of phenol
Heavy metals	Toxic, cumulative poisons. Stop nitrification and digestion of sewage and kill fish	Precipitation. Ion exchange and chelation	Concentrate and remove heavy metals. Recover valuable materials for re-use
Cyanides	Extremely poisonous. Stop biological processes and kill fish	Precipitation, chlorination	Total removal of cyanides
Detergents	Inhibit sedimentation, cause foaming, slow down normal sewage treatment	Antifoaming additions	Stop interference with normal sewage treatment
Radioactive wastes	Cumulative poisons	Concentration and separation by methods used for nonradioactive substances	Total recovery for storage or burial. Destruction not possible at present
Smokes and gases	Produce noxious odors, soot, toxic fumes, corrosion of metals and destruction of organic materials	Gas scrubbing and precipitation of solids	Reduce content of solids and volatiles
Trash and solids	Public nuisance. Unsightly. May clog sewers	Incineration, sanitary fills, dump heaps, for slags and similar materials	Destroy or bury. Store for possible reclamation
Chromic acid	Strong oxidizer, destroys bacteria	Reduction and precipitation of chromium	Removal and recovery of metal
Solvents	Volatile. May burn or explode. Heavy ones may pool in sewers. Must be kept out of sewer	Redistillation	High percentage of re-use
Worn-out salt baths	None with sufficient dilution, unless cyanide containing. Then poisonous	None unless cyanide containing. Then must be buried	Destruction by dilution or burial

Why Waste Treatment Is a Production Cost

(What chemicals really cost when you add in the cost of waste treatment to get rid of them)

All figures in cents per pound

Chemical	Sulphuric acid	Chromium oxide	Sodium cyanide
Purchase price of chemical	1.5	27	17
Treatment agent	dolomitic hydrate	sodium pyrosulphite	chlorine
Cost of treatment agent per pound of chemical appearing in waste	0.6	7	198
Miscellaneous costs per pound of chemical appearing in waste	1.4	1.7	1
True cost of chemical	3.5	35.7	216

Source: Electroplating Engineering Handbook

posal of certain wastes in that manner.

4. Industrial wastes represent an additional burden on sewers and waste disposal plants, chargeable against the waste producers by a system of sewer rents and special treatment charges.

5. Industry has a moral obligation to dispose of its wastes without hazard or discomfort to others. It should be a good neighbor and a friend upstream.

That's where you stand when you start to review your own waste situation. Now go back into the plant and begin to look around. First, you'll be looking for obvious things like bad housekeeping.

Sloppiness — It is a notorious breeder of waste. Spills, drips, slopovers, leaks and rubbish on the floor can pour money down the drain at an unbelievable rate. It costs far less to capture something at its source than it does to bail it out of the sewer.

What do your employees know about waste? If they know what waste costs to retrieve or destroy, what legal and social problems it creates, aren't they likely to do a better job? You don't get far in waste control without education.

Outside Aid—These things you can do yourself. After you've done all you can with housekeeping and education, it's time to call in the experts. There are four good places to turn for help:

1. Consulting sanitary engineers: These men are impartial. They will be able to recommend practical solutions, based on wide experience. If a consultant's fee seems high, weigh it against the value of his advice, including the lawsuits you may not have to fight.

2. Manufacturers of disposal equipment: You get expert engineering, backed by a history of performance in similar situations. You'll have to make your own decisions on the relative merits of proposals from different companies. Going to the equipment manufacturers may be the fastest way of getting the job done.

3. Local sewage authorities. These people are eager for your co-operation and can help you a lot. They may suggest ways to trap problem wastes before they get into the sewer system. Sometimes they can work out a schedule which will permit you to release wastes when the disposal plant can handle them.

They may add refinements to the disposal plant so that it can handle wastes from other industries like yours, and you can share the cost. That may cost less than going it alone.

4. State, regional and watershed authorities: Here's where you go for information on permissible levels of stream contamination. It takes a license to dispose of waste in certain ways, such as in deep wells and mines.

These people know the legal angles. They also are the mirror of public opinion and the focus of public pressure. The best of them are sympathetic to industry's predicament and willing to help anyone in a co-operative mood.

Don't be taken in by places that lure industry with easy water pollution laws. That situation can change overnight.

Segregate—Wherever you turn for help, you'll get the advice that waste is easiest handled if it isn't allowed to mix. That means isolating acids, alkalies, oils and greases, organic chemicals, metal salts, trash, cyanides and brines at the start.

Acids and alkalies, brought together under controlled conditions, can be used to neutralize each other. There's a market for waste oil. Some organic materials, if not heavily adulterated, can be handled by municipal disposal plants. Metals (which may poison a sewer system) often can be economically reclaimed. Cyanides are too poisonous to be tolerated in sewers and watercourses.

Water, possibly your most valuable waste, can be reclaimed for immediate re-use if not too heavily contaminated.

Origin—But before the engineers draw up plans for your disposal facilities, they'll have a long look at the points of waste origin. They'll be considering changes you can make in manufacturing that will cut their task down in size.

What about blast cleaning instead of acid pickling? Would a different cutting oil be easier to get rid of? In plating and cleaning lines, longer drip time between tanks could lessen contamination of one bath by another and keep wastes concentrated. Dikes and

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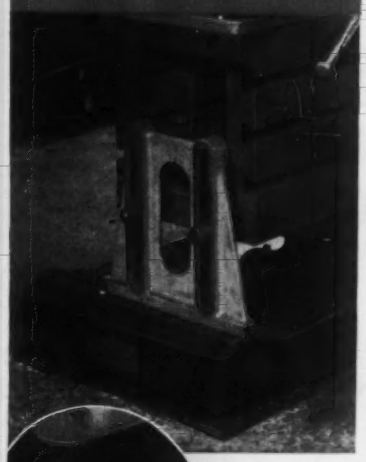

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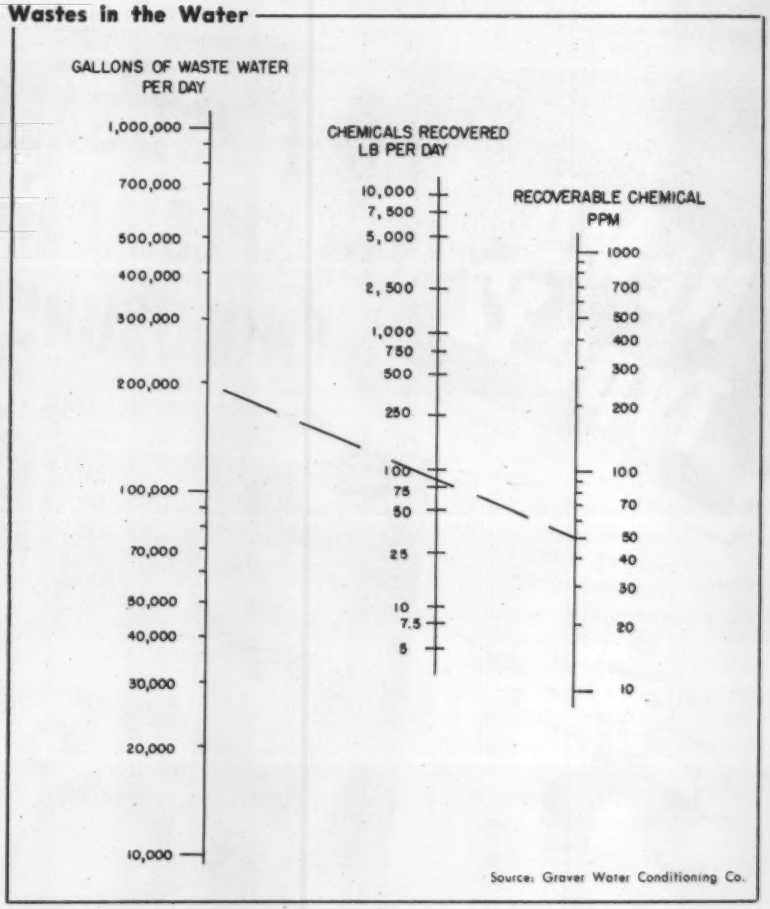
Wastes in the Water



Source: Grover Water Conditioning Co.

intercepting sumps would safeguard the sewers against tank failure or accidental opening of a valve.

It's worth repeating: Catch the waste at its source.

Possibilities — The treatment methods the engineers finally recommend will depend on:

1. Regulations affecting plant discharges.
2. Use and value of recovered chemicals.
3. Use and value of recovered water.
4. What you can afford to pay for equipment.
5. Chemical operating costs.
6. Available space.
7. Flow conditions within your plant.

In a typical metalworking plant their recommendations may include a settling and skimming tank for oils and solids, mechanical screens to catch rags and trash, ion exchange or chemical precipitation equipment to trap metallic salts, filtering and clarifying units to catch small solids and organic matter, neutralizing equipment for acids, alkalies and cyanides. The latest trend is to fit the clean-up units right into the production line wherever possible.

Such an integrated system has been installed on a plating line by GM's Cadillac Division. It incorporates automatic sampling, automatic chlorine injection to destroy cyanides continuously, automatic control of acid-alkali effluents to a neutral pH for discharge into the sewer and an automatic warning system.

Money Out—We haven't reached the point where all recovered wastes can be turned to profit, but we are getting closer. In any number of cases it is possible to realize a sizable return on treatment cost.

Sintering plants have turned mill scale recovery units into a

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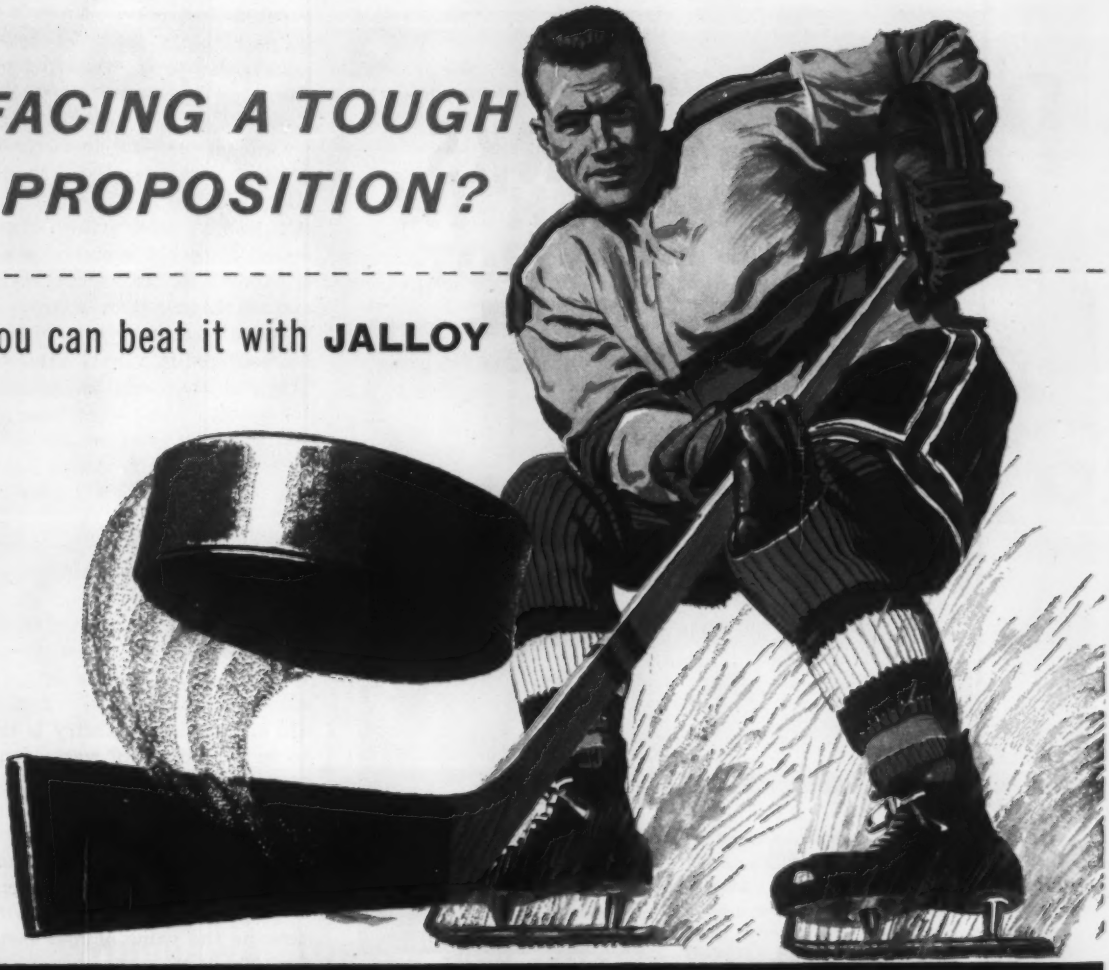

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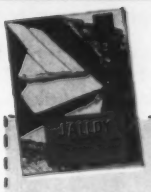

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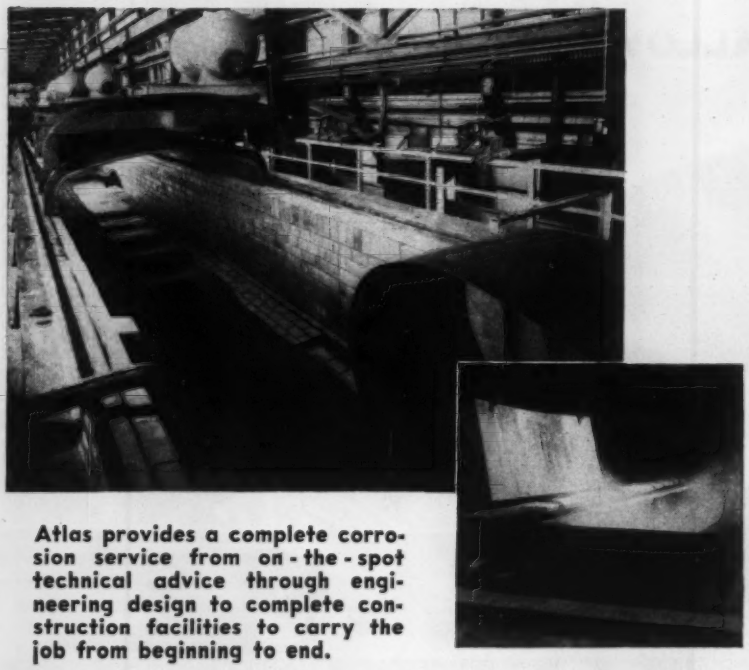
in service to stay



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When you install pickling tanks, you have a right to expect them to deliver service in full measure. You can't get it if these units are the cause of lost production due to down time for repair of corrosion damage.

Pickling tanks of Atlas construction reduce down time to a minimum, because Atlas cements, coatings and linings are designed to handle the rugged abuse of modern pickling.

For a quarter century Atlas has been producing Corrosion-Resistant materials of construction for industry-wide use in combatting corrosion. Atlas, with the advance of technical knowledge, has developed new materials and improved existing products to keep pace with the increasing use of strong pickling agents and higher processing temperatures.

Now Atlas can offer the most complete line of quality corrosion-proof materials available. Your pickling tanks will become a permanent asset when you make sure that ATLAS CORROSION-PROOF CEMENTS, COATINGS, and LININGS are specified.

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ATLAS MINERAL PRODUCTS COMPANY
MERTZTOWN, PENNSYLVANIA

veritable iron mine. Armco's clarification units send 90 tons of scale a day to the sintering plant. One unit recovered 1500 lb an hour.

Dragout of chromium from a plating bath may be 350 times that deposited on the work. Even if it weren't poisonous to drinking water, it would scarcely pay not to recover it. Recovering cyanide can be cheaper than destroying it.

It isn't necesary that chemicals be recovered in a marketable form, provided they can be re-used in the plant. The classic example is water which can be downgraded with minimum treatment for several successive uses before it is sent to the sewer.

For Tomorrow — In planning waste disposal you have to look ahead and design for extra capacity. The laws are getting tight enough so that any new plant virtually has to have its own treatment facilities. Even where laws are lax, modern industry is trying to do a good job of waste disposal as a public duty.

Evidence of that turned up in the news early this year when eight major metalworking industries announced plans to co-sponsor a demonstration plant. It will determine the value of new methods for treating and disposing of waste pickling liquor.

An industrial wastes foundation has been proposed that would provide a central voice for telling the story of industry's contribution to waste disposal. It would sponsor research and development and collect dependable data without the hysteria that has accompanied so many waste investigations.

The cost of waste disposal should come down. Refinements in technique, such as continuous pH control, promise a better job for less money. As the cost of raw materials (including water) goes up, their recovery from waste becomes financially attractive. It amounts to this: The company that ducks its waste control opportunities is behind the times.

• *Extra copies of this article, and a companion article on water published last week, are available in quantities from one to three until supply is exhausted. Write Editorial Service,* STEEL, *Penton Bldg., Cleveland 13, O.*

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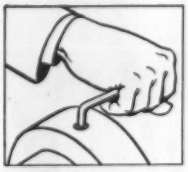
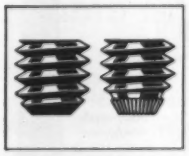
Tests prove that ALLENPOINT Set Screws have 50% HIGHER WITHDRAWAL TORQUE than serrated point set screws



HIGHER WITHDRAWAL TORQUE WITH ALLENPOINTS! In ¼" x ¼" sizes, tightened to shear point of key, Allenpoints required 75 inch-pounds removal torque. Serrated point set screws gave up their hold at only 50 inch-pounds removal torque.



ONE MORE FULL THREAD WITH ALLENPOINTS! Compare, and you'll find that Allenpoints have *one more full thread* than same size serrated point set screws. That means greater holding power, especially in the much-used "square" sizes.

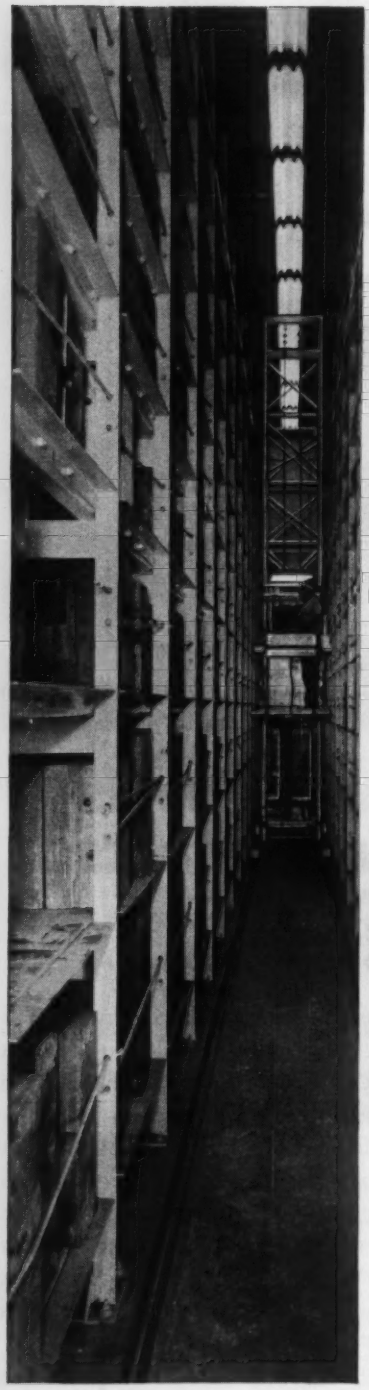
DEEPER, CLEANER SOCKETS WITH ALLENPOINTS! Allenpoint sockets are *"pressur-formd"* to preserve the long fibers of the steel uncut throughout the *entire* length of the screw. This makes a deep socket of maximum strength, in which the key seats with great exactness.

Specify ALLENPOINTS for far greater *holding* power — the kind of fastenings that "stay put". Genuine Allenpoints and other Allen fasteners are available from your Industrial Distributor — standard items immediately, special items very promptly. Write for full information.

You want maximum holding power from every set screw in your product. Here's why you'll get that from ALLENPOINT ○ Set Screws: Allenpoints and serrated point set screws were recently compared in laboratory tests. They were the kind of tests you'd make in your own plant — random samples of each were chosen from regular stock boxes from distributors' shelves.

In each test, keys were tightened right up to the shear point — maximum tightening point for any set screw. In each test, 50% HIGHER WITHDRAWAL TORQUE was required to release the ALLENPOINT ○ Set Screws.

Translated into your own product, this means more dependable fastening with ALLENPOINTS.



A 3000 lb. die handled like a feather with these special Economy die-handling Lifters

Push-button control for elevating the platform, propelling the machine down the narrow aisles, and moving the dies in and out of the racks, gives finger-tip high speed handling. The storage capacity is multiplied ten times the floor area and with every die located for immediate selection.

This die handling system, Economy engineered and built, is an example of how materials handling problems can be solved by Economy engineers who have specialized in custom-built machines for over 50 years.

Our representatives, trained in engineering, are located in all principal cities. Why not call one in on your material handling or overhead servicing problem?

ECONOMY ENGINEERING CO.
4517 W. Lake St., Chicago 24, Ill.
New York Office
342 Madison Ave., New York 17, N. Y.

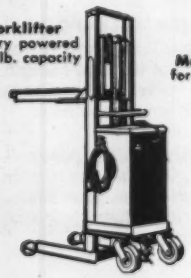
Write for new Catalog No. 55 Forty pages of pictures and suggestions for special and standard machines. Every plant manager and maintenance engineer should have this catalog.

Economy makes a complete line of standard lifters

Barrel Racks

Elevating Table

Shoplifter for handling dies



Worklifter battery powered 1000 lb. capacity

Model PUL for overhead service

Hi-Reach telescopers up to 100 ft.

Electric Indicator Controls Taper Grinding

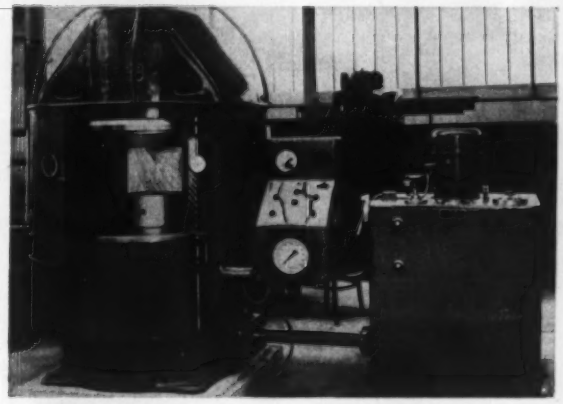
Close-tolerance tapers are controlled accurately by the Swivalign dual electric indicator. It measures the swivel table adjustment.

The device (used on cylindrical and universal grinding machines) simplifies the adjustment of swivel tables to correct errors in grinding exact tapers or to eliminate taper in straight work.

Divisions on a meter scale mark taper changes in thousandths of an inch per foot of taper.

Two ranges of readings are provided. One has graduations of 0.0001-in. per foot, the other 0.0005-in. per foot. The desired range is given by a selector switch on the front of the instrument case. *Write*: Norton Co., Worcester 6, Mass. *Phone*: Pleasant 2-4641

Hobbing Presses Have Capacities Up to 5000 Tons



Hydraulic circuits permit rapid closing and automatic change-over from high to low speed at the lightest contact between the hob and a die.

The change-over from closing to hobbing speeds is adjustable (within predetermined limits) to provide flexibility. Hobbed dies or matrices can be pushed out of holding rings at high speed.

A contact manometer permits preselection of hobbing depth and maximum hobbing pressure. The hobbing speed needed is determined and indicated by a measuring gage.

After desired depth and pressure have been reached, hobbing is automatically interrupted. Light or sound signals are excited. *Write*: Haller Inc., Plymouth, Mich. *Phone*: 3074

Portable Magnetic Inspector Needs No Electricity

Critical parts and welds can be checked by magnetic particle inspection in hazardous areas; with the YM-5 yoke kit, electric arcing is impossible.

Steel aircraft propellers and other critical parts can be inspected.

The need for disassembly, heavy equipment and electric power is eliminated.

The kit, complete with a metal storage and carrying case, weighs only 22 lb. The yoke legs are hinged. Angled tips rotate so that a good magnetic contact can be made on a part of almost any shape.

The Alnico magnet gives a magnetic pull of over 40 lb on a flat surface, while the yoke weighs but 5 lb. *Write*: Magnaflux Corp., 7300 W. Lawrence Ave., Chicago 31, Ill. *Phone*: Underhill 7-8000

CM Lodestar®

ENTIRELY NEW
differently NEW

FLEXIBLE LINK CHAIN

PUSH-BUTTON CONTROL

FEATURING:

- Push Button Control
- Self-Adjusting Heavy Duty Brake
- Sealed-in Lifetime Lubrication
- Overload Protection
- Full Enclosed Components
- Lowest Headroom
- "CM-Alloy" Flexible Link Chain

CAPACITIES: from ½ to 1 ton. Single and 3 phase. ¼ ton model weighs only 51 pounds.

$149.50 and up

Built to serve you without costly maintenance

Lodestar is the first truly "heavy duty" version of the small electric hoist. The CM Lodestar is designed to operate without costly maintenance or interruptions in your work schedules. The initial cost is practically your only cost with a Lodestar... an extremely low cost indeed!

WRITE US or call your CM distributor for literature, prices and quick delivery from stock.

CHISHOLM-MOORE HOIST DIVISION
Columbus McKinnon Chain Corporation
Tonawanda, New York
REGIONAL OFFICES: NEW YORK • CHICAGO • CLEVELAND
In Canada: McKinnon Columbus Chain Limited, St. Catharines, Ontario

CM HOISTS AND CHAIN

NEW PRODUCTS and equipment

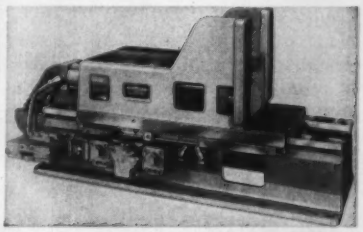
Hydraulic Feed Unit

The thrust on this machine is above the ways near the tool load.

There is positive control of rapid traverse, fine feed and depth.

The flange simplifies mounting and aligning of multiple spindle heads. A 15-in. stroke gives ample tool change clearance.

Thrust depends on hydraulic pressure. At 1000 psi the 4-in. hydraulic cylinder gives 12,000 lb of thrust.



The feed rate is infinitely variable up to 24 ipm, rapid advance is 8 ips and rapid return is 5 ips.

Repositioning control dogs adjust rapid advance and feed stroke lengths.

Multiple spindle motors up to 20 hp, 1800 rpm, can be mounted on the saddle. *Write*: Hartford Special Machinery Co., Hartford 12, Conn. *Phone*: Jackson 5-1401

Carbide Tool Holders

Indexable carbide tool holders can do offset turning and facing operations. Holders come in right and left-hand offset styles.

The tool can be used for square shoulder turning or facing by angling the holder in the tool block 5 degrees. *Write*: Wesson Co., 1220 Woodward Heights Blvd., Detroit 20, Mich. *Phone*: Jordan 6-1500

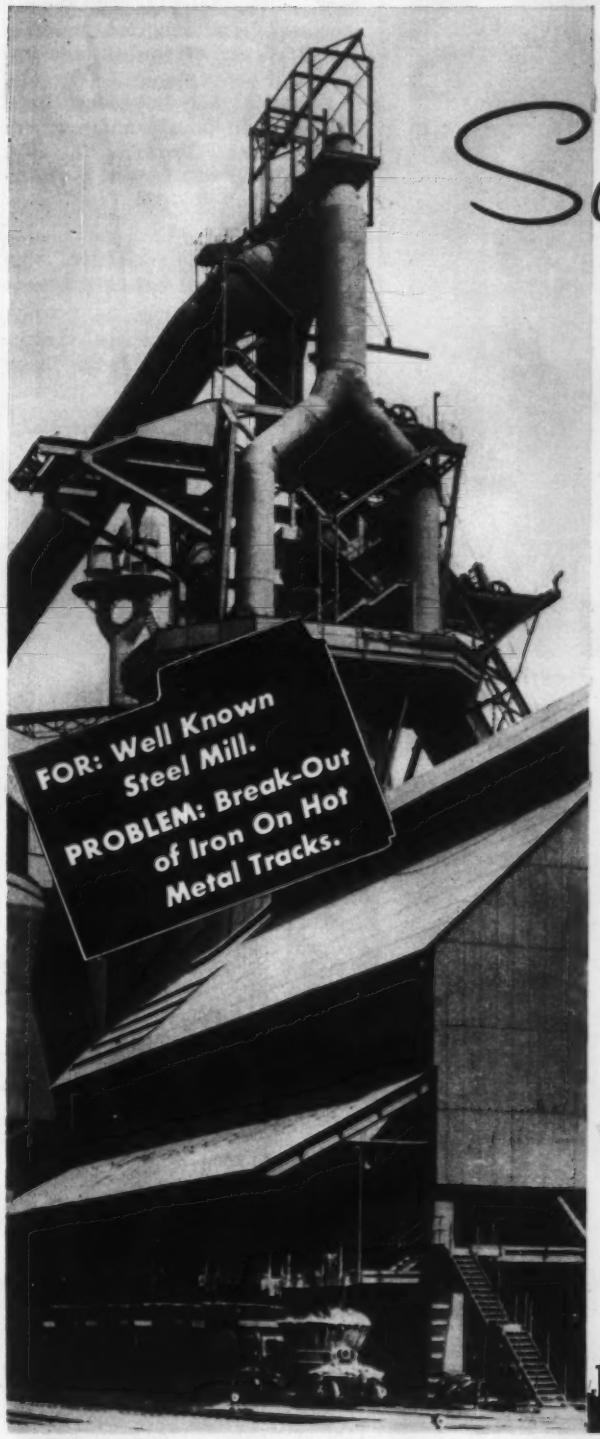
Lubricant Additive

Here is an additive for any type and weight lubricant. It extends the life of the lubricant and increases its efficiency.

In one test, an addition of 2 per cent of Hyperoil increased the load-carrying capacity of a cutting oil nearly 7000 psi.

Another test showed that when 2 per cent of the additive was combined with water-soluble cutting

CHICAGO CONCRETE ON THE JOB IN 2 HOURS



Saved

40 HOURS OF PRODUCTION

"WE THOUGHT OUR FURNACE WOULD BE OUT OF PRODUCTION AT LEAST 2 DAYS . . . BUT WITHIN TWO HOURS AFTER THE BREAK-OUT CHICAGO CONCRETE WAS ON THE JOB . . . AND IN 24 HOURS WE WERE BACK IN FULL PRODUCTION," so commented the superintendent of blast furnaces at a well-known steel mill. It is another story typical of the speed that CHICAGO CONCRETE is capable of — speed that has saved customers thousands of dollars. This is the story:

At 11 P.M. we received an emergency call . . . a break-out of iron on the hot metal tracks had burned up the tracks and welded a number of railroad trucks to them. By 1 A.M. the first CHICAGO CONCRETE men were on the job. In 8 hours they had the spill cleaned up and new tracks laid. Four sets of railroad trucks were saved from the scrap-heap by the careful use of dynamite . . . a service that CHICAGO CONCRETE are experts at.

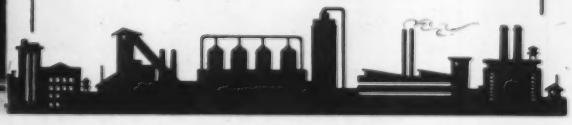
On the job faster . . . with experienced skilled personnel . . . employing the most modern equipment . . . that is CHICAGO CONCRETE'S story. You, too, can depend on CHICAGO CONCRETE in any emergency.

CHICAGO CONCRETE BREAKING CO.

12233 S. AVENUE "O", Chicago 33, Ill., BAyport 1-8400
PITTSBURGH AREA - 213 Corey Ave., Braddock, Pa., Electric 1-1656

AND NOW

CHICAGO CONCRETE CONSTRUCTION COMPANY offers a complete industrial construction service . . . handling anything from minor masonry, steel or foundation repairs to complete furnace rebuilds.

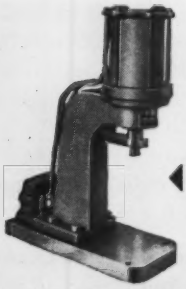


SERVING THE PRIMARY METALS AND OIL INDUSTRIES WITH KNOW HOW, EQUIPMENT AND MANPOWER FOR 35 YEARS

SAVE!

WITH A HANNIFIN AIR PRESS

It's the ideal press for that occasional pressing job. These presses operate off ordinary shop air supply. They're fast and safe. Over 30 models to choose from...many for either bench or floor mounting. Capacities from ½ to 18 tons. Daylight to 46 inches...reach to 12 inches. Prompt delivery.

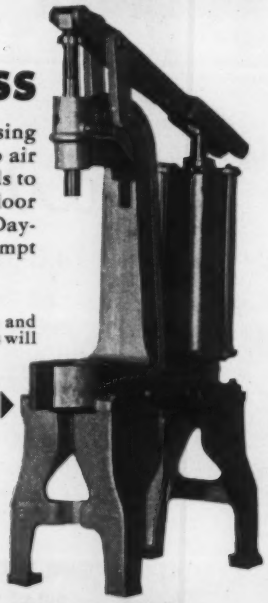


WRITE. Complete information and prices on Hannifin Air Presses will be sent on request.

6 Tons (Model B-2) One of more than 30 models. Press with base, $554.

1-ton Hand-D-Press. For small parts manufacturers. Press, $232.

Prices F.O.B. our press plant, St. Marys, Ohio, subject to change without notice.



HANNIFIN

HANNIFIN CORPORATION, 523 S. WOLF ROAD, DES PLAINES, ILLINOIS

Special Washers
ANY METAL • ANY SIZE
ANY QUANTITY
Over 15,000 Sets of tools at your disposal
THE Master Products CO.
6400 PARK AVENUE • Diamond 1-1740 • CLEVELAND 5, OHIO

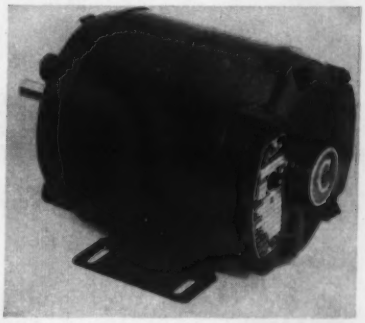
NEW PRODUCTS and equipment

coolants (before they were cut back with water), coolant life increased 75 per cent and the working efficiency of the oil was improved 35 per cent.

The additive is an excellent bactericide and antifoaming agent. *Write*: Destiny Products Co., 2970 W. Grand Blvd., Detroit 2, Mich *Phone*: Trinity 5-7026

Motors

A motor line (1/20 to 1/3-hp) offers weight and space savings with no loss in ruggedness. These 48-frame motors have aluminum end brackets and an aluminum fan for cooling.



The frame is drip-proof. Totally enclosed, unit-heater, permanent-split-capacitator types and others come in both rigid and cushion bases. *Write*: Century Electric Co., 1806 Pine St., St. Louis 1, Mo. *Phone*: Central 1-4920

Cadmium Plating

The Cadalume process protects iron and steel from corrosion, and nonferrous metals from surface tarnish, corrosion and galvanic couples formed in assemblies.

The process increases plating speeds, improves deposit distribution and throwing power and produces heavy deposits, where required, without loss of brilliance or formation of surface defects.

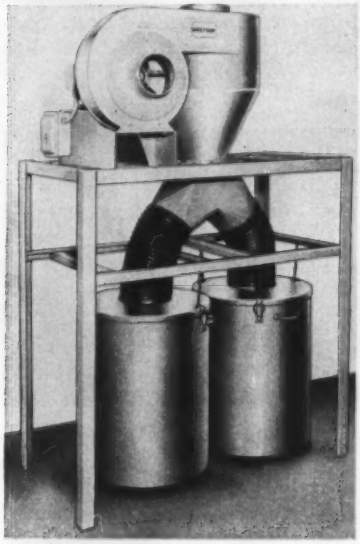
Most conventional cadmium solutions, or a bright cadmium bath, can be converted to the process by adjusting the solution and adding the brightener to the bath.

The bath is a clear solution. Bright dips are unnecessary, although conversion coatings can be

made. No break-in is needed; the desired deposit brightness appears immediately in a balanced bath. *Write*: Hanson-Van Winkle-Munning Co., Church St., Matawan, N. J. *Phone*: Matawan 1-1000

Dust Collector

This unit is for use where cleaned air is to be exhausted outside. Fumes and odors are not removed from the air but merely exhausted through a pipe which is connected to the outlet collar at the top of the separator.

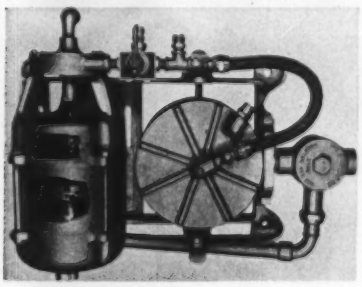


Capacity of the unit is 64 gallons. *Write*: Aget Mfg. Co., Adrian. Mich.

Hot Spraying

Here is a unit for the finishing department that has frequent color changes.

Clean-out and color change take less than a minute. The coil-less heat exchanger and centrifugal



Half-way To OUTER SPACE ... in an ACME Weldment

Inside this steel test chamber men and equipment will face the impact of supersonic flight, *without leaving the laboratory*. Extremes of altitude, temperature, and humidity will yield their secrets to special equipment and instruments. To make possible the many unusual design features, to assure maximum strength with minimum weight, the engineers specified that the complex shell be fabricated by Acme Welding . . . one more dramatic example of the part played in industry today by Acme weldments.

Perhaps an Acme weldment can improve your product. Why not call on Acme *today*.

A.S.M.E. U68-U69 Qualified Welders • A.P.I.-A.S.M.E. Approved
Underwriters Label and Inspection Service • Navy Approved
National Board Approved • Hartford Steam Boiler Inspection Service

Send us your blueprints for a prompt quotation and ask for our informative folder, ACME PLANNED WELDMENT FABRICATION.

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DIVISION of THE UNITED TOOL & DIE CO.
1044 New Britain Ave. • West Hartford 10, Conn.

STEEL • STAINLESS STEEL • EVERDUR • ALLOYS • CUSTOM FABRICATORS of PRESSURE VESSELS • MACHINERY BASES and COMPONENTS • WELDED ASSEMBLIES • STEEL TANKS

Your plant is in this picture

- Weldments
- Components
- Assemblies
- Sub-Assemblies
- Cabinets
- Housings
- Enclosures

IT might as well be YOUR plant, for in it, Kirk & Blum can bring your drawings to life . . . with substantial savings for you in costs and capital investments.

Kirk & Blum offers complete facilities for the fabrication of sheet and plate to ½" thickness—and light structurals. We specialize in aluminum, monel, stainless and other alloy fabrication.

In the modern 150,000 sq. ft. Kirk & Blum plant is to be found the latest metalworking equipment available, operated by skilled sheet metal craftsmen. Overhead cranes, to 25 ton capacity, serve entire assembly areas and interior rail siding. A new warehouse contains extensive inventories of materials. Coordinated for speed, versatility and accuracy, these facilities assure successful and economical completion of your products.

THE KIRK & BLUM MANUFACTURING CO.

3238 Forrer Street
Cincinnati 9, Ohio
Established 1907

KIRK & BLUM
SHEET METAL FABRICATION

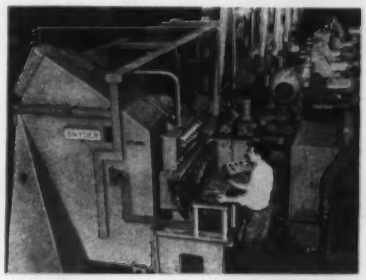
NEW PRODUCTS and equipment

pump combined with the maintenance-free unit are expected to expand the use of the hot spray method. *Write*: Spee-Flo Co., 720 Polk Ave., Houston, Tex. *Phone*: Blackstone 0461

Manifold Machining

This segmented transfer machine uses horizontal way units in milling, drilling and tapping a cast iron automotive intake manifold.

A vertical angular rail eliminates turnover operations. The manifolds are transferred on the rails that travel the length of the machine.



The 20-station, 54-ft long machine produces 68 manifolds an hour at 80-per-cent efficiency. *Write*: Snyder Tool & Engineering Co., 3400 E. Lafayette Ave., Detroit 7, Mich. *Phone*: Lorain 7-0123

Laboratory Crucible

A cermet, zirconium boride, is the basis of a new crucible with high temperature and corrosion-resistant properties.

Its melting point is 3900°F.

NOW—IN 50 POUND DOUBLE BURLAP BAGS

America's Foremost Line of METAL ABRASIVES

- **Lighter Weight** — 50-pound bag twice as easy to handle as 100-pound bag. Plant workers like it — praise it!
- **Double Bag** (one bag within the other) — Stronger, pliable — absorbs repeated shocks in shipment and handling — no breakage — no spillage — no waste of contents. Heavy paper band-label gives **triple** protection.
- **Easier Stacking** — Bags "tie in" better — no slipping — no crushing or breaking of bottom layers as with cartons.
- **Greater Safety** — Burlap bags handle easily by the neck with one hand, or in any position with two hands — no slick, hard cardboard surface to slip and fall — no injured feet — no breakage.
- **Greater Handling Efficiency** — Speeds unloading trucks, handling within plant — 50-lb. bag handles easily, **surely** — no fishing for hard-to-hold, hard-to-handle cartons — cuts time and cost.

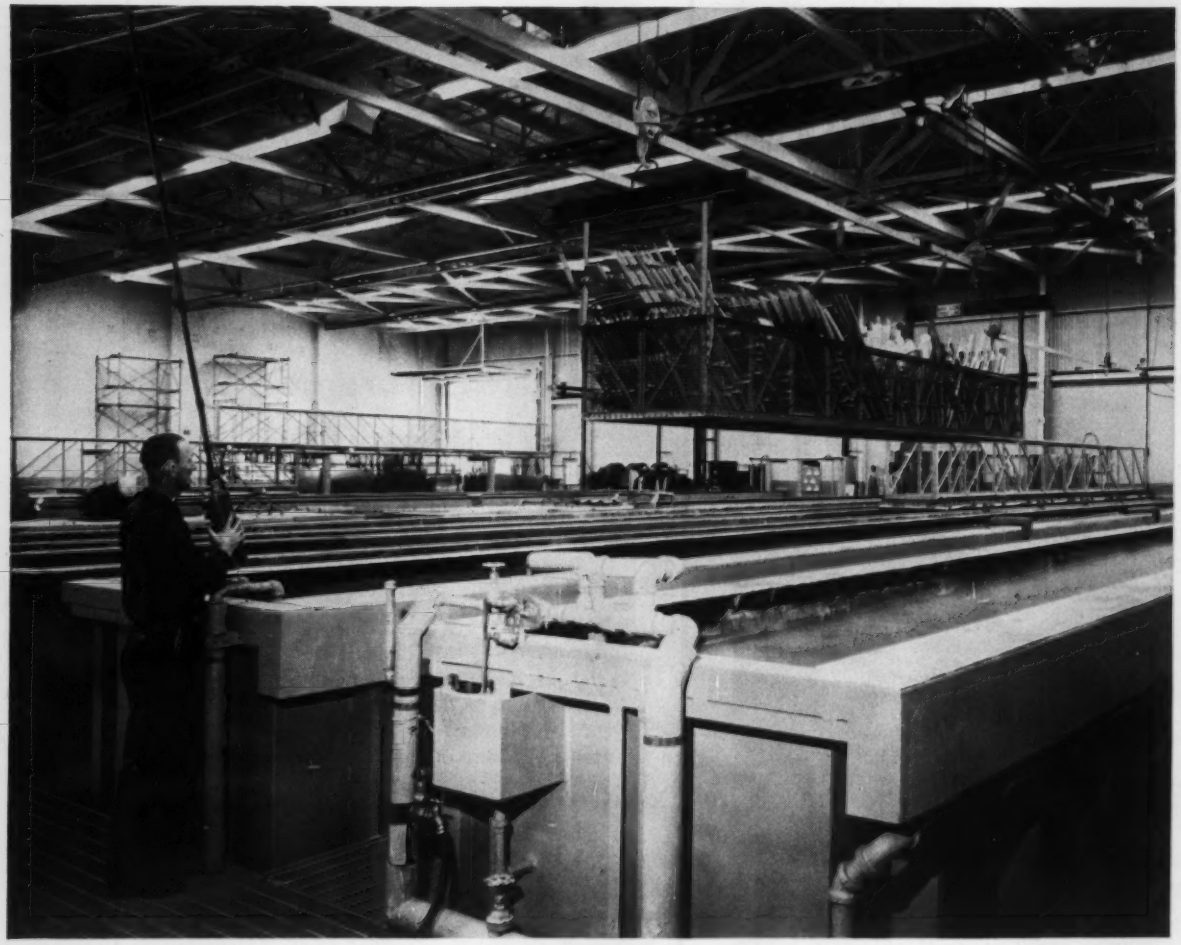
PITTSBURGH CRUSHED STEEL CO.

Arsenal Station, Pittsburgh 1, Pa.

Subsidiaries:

Globe Steel Abrasive Co., Mansfield, Ohio
Steel Shot Producers, Inc., Butler, Pa.

METAL ABRASIVES FOR EVERY NEED



Alodizing at Boeing is done in a series of 80 ft. dipping tanks. Each takes 76 ft. spars and whole B-52 wing panels.

BOEING ESTIMATES SAVINGS OF MORE THAN $300,000 A YEAR OVER ANODIZING BY ALODIZING WITH ALODINE®

ACP chemical conversion process cuts treatment time by 33%, provides more uniform anticorrosion coating

The Alodizing process takes little more than an hour to uniformly coat a batch of aluminum parts—and when dry they are ready for painting.

Savings through reduced costs of heat, water, power, compressed air, labor, and process time are estimated at $300,000 annually. And there's another important saving: a scratch in the chemical coating can be quickly and easily repaired, in contrast with a damaged anodic coating, which requires costly stripping and replating.

Another tangible, but inestimable, saving is the result of the technical assistance offered by ACP. Our Engineering and Service Departments worked closely with Boeing in recommending the right equipment, training personnel in the simple operation of the process, and checking samples of the finished product in our Quality Control Laboratory.

We can do the same for you. Write for the complete story of Alodizing with Alodine.

AMERICAN CHEMICAL PAINT COMPANY, Ambler 19, Pa.

DETROIT, MICHIGAN NILES, CALIFORNIA WINDSOR, ONTARIO

CHEMICALS ACP PROCESSES

Stress-to-rupture life at 1800°F and 14,000 psi is 1000 hours in still air.

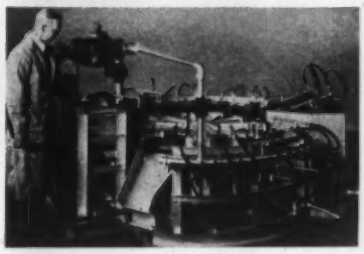
The crucible handles molten aluminum, brasses, bronzes, copper, cryolite, fluorides, iron oxide slag, jet engine alloys, lead, magnesium, steel, tin and zinc, as well as nitric acid, hydrochloric acid and hydrogen peroxide.

There are two sizes; both are 3 in. in diameter; one is 1½-in. high; the other is 3 in. high. *Write*: Fisher Scientific Co., 717 Fisher Bldg., Pittsburgh 19, Pa. *Phone*: Express 1-1330

Heat Processing

Three holes in a steel brake shoe web are selectively hardened by this machine.

Hardness control is improved, warpage is eliminated and production increased.



The machine automatically treats 165 pieces an hour with only 765 cu ft of natural gas premixed with air.

The heating area is closely limited, and hardness and temper are accurately controlled.

Each web is indexed through four heating stations, a spray water quench, three heating stations for draw and an automatic discharge. *Write*: Selas Corp of America, Philadelphia 34, Pa. *Phone*: Garfield 6-7600

Induction Heating

A control station (for use with remote station and motor generator equipment of 960, 3000 or 9600 cycles and 30 to 300 kw) increases reliability and reduces maintenance costs.

Protective devices include instantaneous overload relays, a ground detector and door inter-

FREE!

NOW LEADED!

Now you can obtain the advantages of leaded 52100 Steel in round bar stock. The presence of lead acts as a lubricant, resulting in freer machining, quicker, cleaner cutting, better finishes and longer tool life. All these advantages are conducive to greater production at reduced costs.

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UNION, NEW JERSEY
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ALLOY Wire...Rod...Strip

Spring Designers: You can readily select a material with just the right combination of properties for your tough spring applications from the alloys we fabricate into wire, rod and strip. Alloys such as Monel, K Monel, Inconel, Inconel X, Nickel, Duranickel, Austenitic, Ferritic and Martensitic Stainless Steels and special alloys are available in a wide range of tempers and special treatments. These materials feature high strength and fatigue properties at elevated temperatures, good ductility at sub-zero temperatures, low magnetic permeability and excellent resistance to a wide variety of corrosive conditions.

Alloy Metal Wire Division engineers will work closely with you to develop any special engineering and fabricating properties you may require. Your inquiries are always welcome.

Send today for our new Nickel Alloy and Stainless Steel Properties Charts.

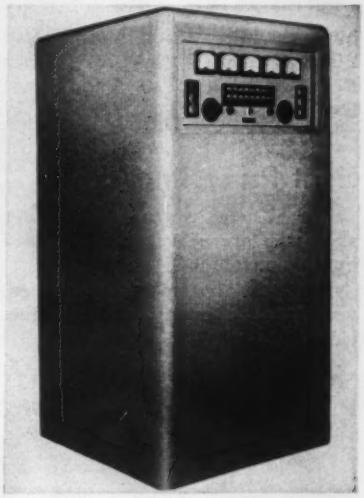
ALLOY METAL WIRE DIVISION

H. K. PORTER COMPANY, INC.
Prospect Park, Pennsylvania

NEW PRODUCTS and equipment

locks which instantly remove high voltage when access doors are opened.

A remote heating station provides output flexibility for heat treating and fabricating operations, including tempering, annealing, selective hardening, normalizing, shrink fitting, stress relieving, hot forming, forging, brazing and soldering.



The station has heavy bus bars aranged for easy installation and removal of the output transformer. *Write*: Lindberg Engineering Co., 2450 W. Hubbard St., Chicago 12, Ill. *Phone*: Monroe 6-3443

Can Closing Machine

This machine can double-seam up to 1000 round cans a minute.

It has eight seaming units in a revolving cage.

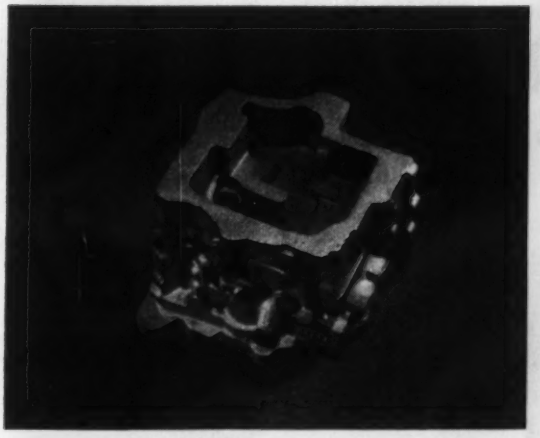
Cans from 202 to 211 in diameter and 211 to 604 in height can be closed.

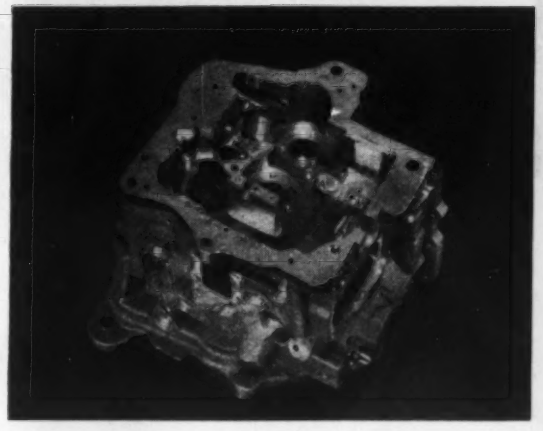
The machine weighs 8880 lb and requires a floor space of 44 x 46 in. *Write*: American Can Co., 100 Park Ave., New York, N. Y. *Phone*: Murray Hill 6-4900

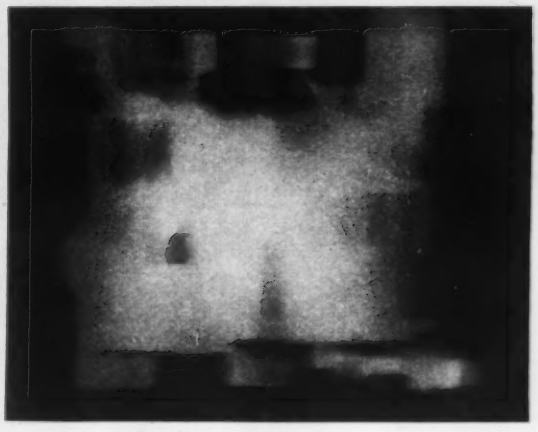
Compressor

This unit is for foundries and metalworking plants where compressed air is used to power pneumatic machinery and small portable tools.

Compressor models of type FMP







Sound casting yield jumped from 50% to 96%...

when radiography pointed the way

A jet plane fuel pump called for this intricate casting. The alloy was 355 AMS4214—often prone to gas holes and shrinkage. Rejects from the initial supplier ran as high as 50 per cent.

Then Oberdorfer Foundries undertook to do the job. By studying radiographs made of pilot castings, they developed new methods of gating and position of chills. Sound casting yield rose to 96 per cent. Costs dropped. And an enthusiastic customer became a firm friend.

This is typical of the ways radiography can improve foundry operations. It points ways to better castings. It saves countless hours of expensive machining by exposing castings not worth the work.

If you'd like to talk about radiography—discuss how it could help you, get in touch with your x-ray dealer. Or if you like, send for a free copy of our booklet, "Radiography as a Foundry Tool."

EASTMAN KODAK COMPANY
X-ray Division
Rochester 4, N.Y.

RADIOGRAPHY...

another important example of Photography at Work

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New WATERBURY FARREL ROTOR VANE* FEED

IMPROVES THIS SCREW PRODUCTION PARADE

THE WATERBURY FARREL PATENTED
AUTOMATIC ROTOR VANE FEED THREADER
No. 10 size—125 blanks per minute
Other sizes available:
No. 20—100 blanks per minute
No. 0 —125 to 150 blanks per minute
No. 00—145 to 175 blanks per minute
WATERBURY

Waterbury Farrel's latest improvement in thread roller design, the patented Automatic Rotor Vane Feed, assures steadier production of threaded screws.

The new feeding arrangement delivers not only the normal range of blanks, but also shorter blanks, more efficiently than previous feeds, permitting increased production speeds.

OTHER WF DESIGN FEATURES

The chutes, the mechanism which transfers each blank from chutes to dies and the dies themselves are all in the same angular plane, eliminating any twisting or turning of blanks in process.

The cross transfer mechanism can be locked in its back position by a spring plunger, checking the feed to allow minor adjustments without stopping the machine.

The machine is built to accommodate maximum depth dies, making it possible to vary die capacity by use of filler plates.

Write for the complete story on this modern, high output, thread roller or on any other WF machine.

WATERBURY FARREL FOUNDRY & MACHINE CO.
WATERBURY 20, CONN.
Sales Offices: Chicago, Cleveland, Millburn, N. J.

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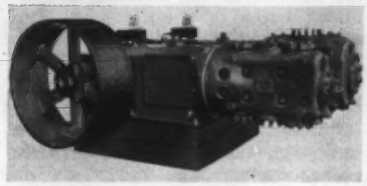
FOUNDED WATERBURY FARREL 1851

WF-8

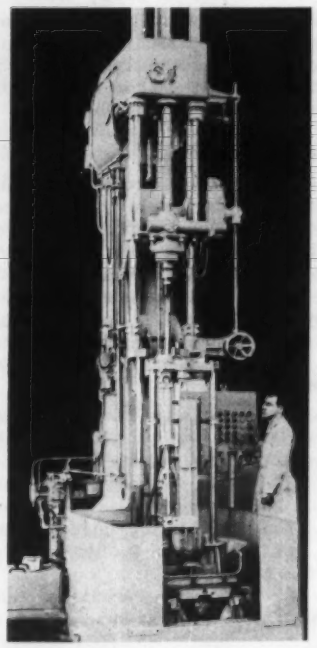
NEW PRODUCTS and equipment



range in capacity from 100 to 300 hp. *Write*: Cooper-Bessemer Corp., Mt. Vernon, O. *Phone*: 8-2121

Honing Machine

The maximum head stroke of this honing machine is 50 in. Its work diameter capacity is 15 in.



The machine has an eight-speed transmission, a variable-delivery hydraulic pump and a safety interlock to hold the head in the up position. *Write*: Micromatic Hone Corp., 8100 Schoolcraft Ave., Detroit 38, Mich. *Phone*: Webster 3-7835

Aluminum Buffing

Bar and liquid buffing compounds for cutting and coloring aluminum counteract metal's tendency to drag under buffing.

Bar compounds range from "greasy" for heavy-duty applications to medium greasy for general purposes.

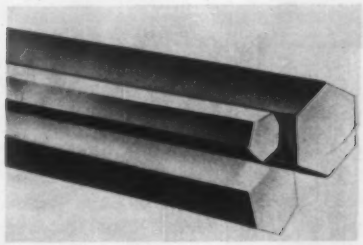
For cut and color, white compounds are used.

Aluminum oxide compounds give high color. *Write*: Hanson-Van Winkle-Munning Co., Church St., Matawan, N. J. *Phone*: Matawan 1-1000

Hexagonal Bars

These C-1018 bars, 3¼, 3½, 3¾ and 4 in. in diameter, are for the production of large nuts, bolts and other hexagonal shapes.

They eliminate the need to make



hexagonal shapes by machining round bars or by using forgings. *Write*: Advertising Dept., LaSalle Steel Co., P.O. Box 6800 A, Chicago, Ill. *Phone*: Regent 4-7800

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SPECIAL HAZARD SYSTEMS APPLICATION CHART

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NEW literature

Write directly to the company for a copy

Shaped Alloy Wire

Stainless steel and nickel alloy wire are covered in bulletin T-2—4 pages. Alloy Metal Wire Division, H. K. Porter Company Inc., Prospect Park, Pa.

Coal Dust Control

Use of exhaust ventilation and cloth tube dust collectors in conveying and preparing coal is discussed in bulletin 551-D. Wheelabrator Corp., Mishawaka, Ind.

Adhesive Selector

A chart recommends adhesives for bonding common materials. Daubert Chemical Co., 333 N. Michigan Ave., Chicago 1, Ill.

Plastic Dies

A series of metal forming bulletins outlines the manufacture, uses and advantages of plastic draw dies, stretch press dies and hydroform dies. Marblette Corp., 37-21 30th St., Long Island City 1, N. Y.

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Heat Resistant Cable

Butyl-rubber insulated cables are specified in a 48-page data book giving information for selecting and applying cable to specific jobs. Keystone, Hazard Division, Okonite Co., Passaic, N. J.

Rubber Seals

Silicone rubber products that resist high and low temperatures, ozone, sunlight and aging are described in bulletin AD147, 8 pages. Garlock Packing Co., Palmyra, N. Y.

Portable Lifts

A line of hand and battery-powered hydraulic lifts with capacities from 500 to 2000 lb is described in an 8-page bulletin. Oster Mfg. Co., Box 4326, Cleveland 32, O.

Laboratory Emergency Chart

A revised chart lists emergency treatments for poisons, accidents and corrosive chemical burns. Fisher Scientific Co., 420 Fisher Bldg., Pittsburgh 19, Pa.

Steel Conduit

A 20-page booklet covers heavy and thin-walled steel raceways, galvanized and black-enameled rigid steel conduit, electrical metallic tubing and plastic-coated steel conduits—bulletin 18-255. Construction Materials Division, General Electric Co., Bridgeport 2, Conn.

Tools

A complete line of hand measuring tools and precision instruments, steel tapes, steel rules, dial indicators and dial gages, hacksaws, hole saws, band saws and precision ground die and flat stock is presented—catalog 27, 480 pages. L. S. Starrett Co., Athol, Mass.

Visual Alarm Systems

Annunciators (electrically controlled signal boards) for industrial and public utility use are covered in a 32-page bulletin. Autocall Co., Shelby, O.

Electric Welder

A combination 200-amp welder and 4-kva stand-by power unit which uses alternating current is described in a 4-page bulletin. Lincoln Electric Co., Cleveland 17, O.

Woven Wire Slings

This catalog describes a line of wire slings, including slings covered with neoprene or plastic. Cambridge Wire Cloth Co., Cambridge, Md.

Industrial Roofing

Installation techniques for industrial roofing and siding are given in

NEW LITERATURE

a 16-page booklet. Industrial Service Division PR 156, Kaiser Aluminum & Chemical Sales Inc., 1924 Broadway, Oakland 12, Calif.

Wire Cutting Machines

Wire straightening and cutting machines, wire reels and a chamfering and deburring machine are covered—bulletin 55-3, 12 pages. Lewis Machine Co., 3441 E. 76 St., Cleveland 27, O.

Metal Degreasers

Standard and special apparatus for grease and dirt removal in manual and conveyor-operated systems are outlined in bulletin 521, 4 pages. Circo Equipment Co., 51 Terminal Ave., Clark Township (Rahway), N. J.

Iron Powder

Processes used to make electrolytic and reduced iron powders are described in bulletin 2, 12 pages. Plastic Metals Division, National-U. S. Radiator Corp., 342 Madison Ave., New York 17, N. Y.

Special Steels

Details on stainless steels, electrical materials, Carmet carbide materials and tool steels are given in a 16-page booklet. Sales Department, Allegheny Ludlum Steel Corp., 2020 Oliver Bldg., Pittsburgh 22, Pa.

Vertical Lathe

A production lathe with platens for mounting turning or grooving slides, multiple tool slides or tracer slides is presented in bulletin Vl-1, 6 pages. Sundstrand Machine Tool Co., Rockford, Ill.

Scale Indicators

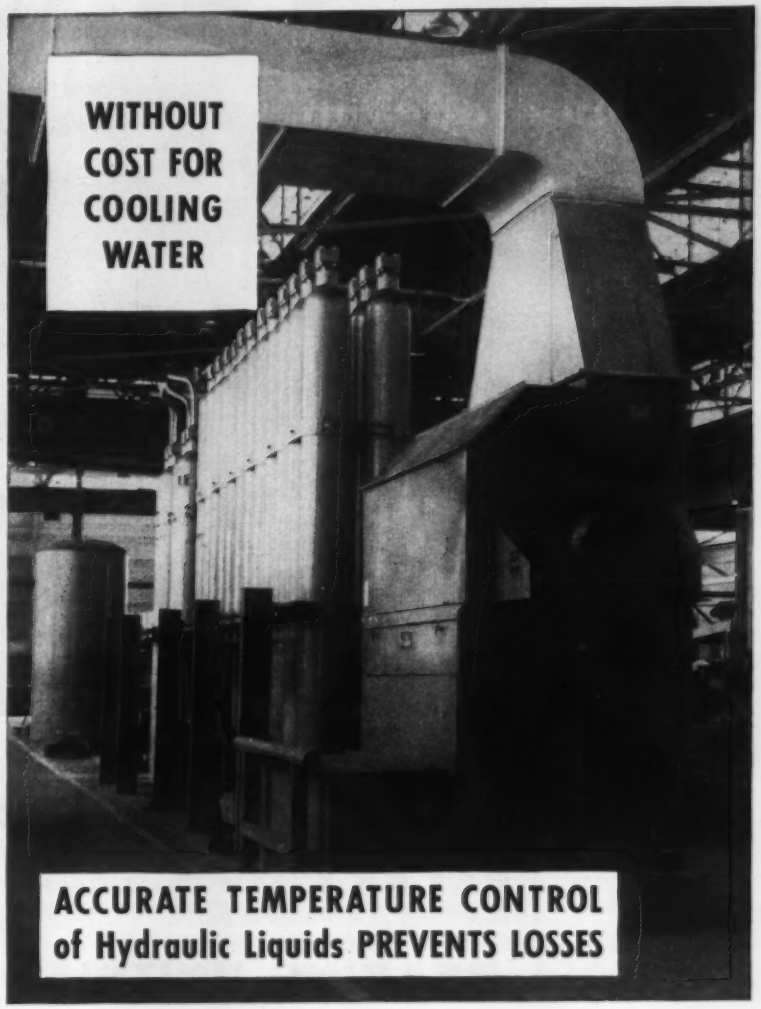
Bulletin 7040 describes an indicating pressure controller available in ranges up to 200 psi. Bulletin 7202 covers a vertical scale controller. Industrial Division, Minneapolis-Honeywell Regulator Co., Wayne & Windrim Ave., Philadelphia 44, Pa.

Automatic Controls

Mercury switch controls for heating, refrigeration, air conditioning and industrial uses are described in catalog 856, 52 pages. Mercoid Corp., 4201 Belmont Ave., Chicago 41, Ill.

Deflection Indicator

A magnetic-amplifier deflection indicator for safeguarding hydrostations, compressor and pumping stations and driveshafts is described—bulletin 05B8385, 8 pages. Allis-Chalmers Mfg. Co., 1021 S. 70th St., Milwaukee, Wis.



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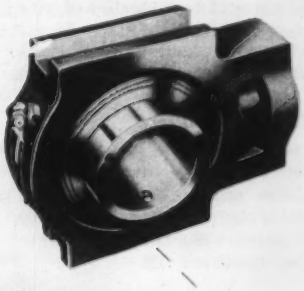
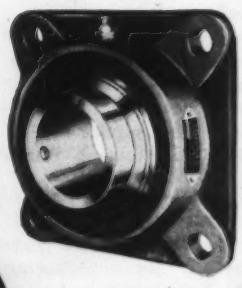




Write for Bulletin 454. It's a must for your file.

SEALMASTER BEARINGS A DIVISION OF STEPHENS-ADAMSON MFG. CO., 99 RIDGEWAY AVENUE, AURORA, ILLINOIS

STEEL

February 6, 1956

Market Outlook

THE steel industry will operate at near capacity through June, despite consumption reductions by the automobile industry.

Assuring strong business for the steel mills is a rolling adjustment now under way: A situation in which one consumer increases its orders as fast as another consumer drops out.

As long as there are rolling adjustments, industry will roll up a good volume of business.

AIMING HIGH—Whatever steel the auto industry doesn't want is grabbed eagerly by other consumers. There's isn't a whole lot to grab, though. The auto industry hasn't reduced its carbon steel demand as much as it has cut production. Despite its production cuts, the industry is programming 606,100 passenger cars for 29-day February, equivalent to 7 million units a year. That's a respectable rate when you consider only one year—1955—has yielded more than that.

READY TAKERS—Ready to snatch any steel tonnage the auto industry might not want are numerous other industries, notably the railroad freight car builders and the construction industry. The problem will be to switch semi-finished steel into the needed products. Autos don't use the same kind of steel freight cars and construction do.

TRAINS OF ORDERS—The freight car builders had orders on Jan. 1 of this year for 147,320 cars—ten times as many as on the comparable date a year earlier. A freight car takes an average of 22½-tons of iron and steel. The production of 147,320 cars requires as much finished steel as the steel industry can produce during two weeks of capacity operations.

BIG BUILD-UP—The fast pace of the construction industry can be seen in the backlog of orders for fabricated structural steel. That backlog (2,243,046 net tons) on Jan. 1 was the largest since 1952. Strength of the construction industry's demand for steel is demonstrated by the build up of the backlog in midwinter, seasonally the slowest period of the year for construction.

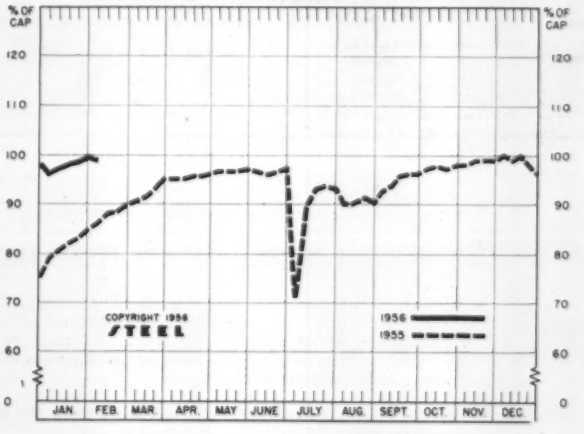
Shipbuilders are adding some strength, too, to the rolling adjustment. They took $166,480,000 worth of Navy contracts for seven destroyers and three frigates.

NEAR THE TOP—Reflecting heavy demand, mills produced steel for ingots and castings at 99 per cent of capacity in the week ended Feb. 5, compared with 99.5 per cent in the preceding week. A 99-per-cent rate yields 2,437,000 net tons. A 2.4-million-ton weekly rate was attained for the first time at the end of last October. In the 15 weeks since then (including two holiday weeks), output has equaled or exceeded that mark ten times.

PRICE TRENDS—Prices of finished steel continue their uptrend. Producers are raising extras on three of the lower-profit products—carbon plates, heavy hot-rolled carbon sheets and hot-rolled carbon strip. The increase averages 5 per cent on plates and 3 per cent on sheets and strip.

Steelmaking scrap continues downward from its high point of $53.33 a gross ton of a few weeks ago. In the week ended Feb. 1, STEEL's steelmaking scrap composite was $50.50, compared with $51.50 in the preceding week.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

	Week Ended Feb. 5	Change	Same Week 1955	Same Week 1954
Pittsburgh	100.5	— 0.5	82	88
Chicago	98.5	— 3*	88	84
Mid-Atlantic	102	+ 3	84	76
Youngstown	98	— 2	88	63
Wheeling	100.5	+ 2	95.5	75
Cleveland	101	+ 5*	87	80
Buffalo	105	0	100	80.5
Birmingham	96.5	0	79	80.5
New England	89	— 1	79	65
Cincinnati	96.5	+ 0.5	90.5	66.5
St. Louis	106	+ 7	86.5	36.5
Detroit	97	— 3	91.5	79
Western	107	— 3	87	80
National Rate	99	— 0.5	88	74

INGOT PRODUCTION‡

	Week Ended Feb. 5	Week Ago	Month Ago	Year Ago
INDEX (1947-1949=100)	149.8†	153.9	149.6	128.9
NET TONS (In thousands)	2,406†	2,472	2,403	2,070

*Change from preceding week's revised rate. †Estimated. ‡Amer. Iron & Steel Institute. Weekly capacity (net tons): 2,461,893 in 1956; 2,413,278 in 1955; 2,384,549 in 1954

Metalworking Outlook—p. 69 Technical Outlook—p. 117

Price Indexes and Composites

FINISHED STEEL PRICE INDEX (Bureau of Labor Statistics)

	Jan. 31 1956	Jan. 24 1956	Month Ago	Jan. Average
(1947-1949=100)	156.4	155.8	155.6	155.3

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended Jan. 31

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parenthesis. For complete description of the following products and extras and deductions applicable to them write to STEEL.

Rails, Standard, No. 1	$4.800	Sheets, Electrical	$10.175
Rails, Light, 40 lb	6.217	Strip, C.R., Carbon	8.243
Tie Plates	5.625	Strip, C.R., Stainless, 403 (lb)	0.444
Axles, Railway	8.000	Strip, H.R., Carbon	5.456
Wheels, Freight Car, 33 in. (per wheel)	52.50	Pipe, Black, Buttweld (100 ft)	16.997
Plates, Carbon	5.033	Pipe, Galv., Buttweld (100 ft)	21.137
Structural Shapes	4.867	Pipe, Line (100 ft)	167.250
Bars, Tool Steel, Carbon (lb)	0.460	Casing, Oil Well, Carbon (100 ft)	165.120
Bars, Tool Steel Alloy, Oil Hardening Die (lb)	0.560	Casing, Oil Well, Alloy (100 ft)	244.670
Bars, Tool Steel, H. R., Alloy, High Speed W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.185	Tubes, Boiler (100 ft)	39.470
Bars, Tool Steel, H.R., Alloy, High Speed W-18, Cr 4, V 1 (lb)	1.680	Tubing, Mechanical, Carbon	20.980
Bars, H.R., Alloy	9.425	Tubing, Mechanical Stainless, 304 (100 ft)	178.897
Bars, H.R., Stainless, 303 (lb)	0.450	Tin Plate, Hot-dipped, 1.25 lb	8.933
Bars, H.R., Carbon	5.500	Tin Plate, Electrolytic, 0.25 lb	7.633
Bars, Reinforcing	5.313	Black Plate, Canmaking Quality	6.733
Bars, C.F., Carbon	8.800	Wire, Drawn, Carbon	8.575
Bars, C.F., Alloy	12.250	Wire, Drawn, Stainless 430 (lb)	0.587
Bars, C.F., Stainless, 302 (lb)	0.473	Bale ties (bundle)	6.473
Sheets, H.R., Carbon	5.265	Nails, Wire, 8d Common	8.595
Sheets, C.R., Carbon	6.214	Wire, Barbed (80-rod spool)	7.847
Sheets, Galvanized	7.770	Woven Wire Fence (20-rod roll)	18.635
Sheets, C.R., Stainless 302 (lb)	0.588		

STEEL's FINISHED STEEL PRICE INDEX*

	Feb. 1 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Index (1935-39 av.=100)	209.10	209.10	209.10	194.53	171.92
Index in cents per lb	5.665	5.665	5.665	5.270	4.657

STEEL's ARITHMETICAL PRICE COMPOSITES

Finished Steel, NT*	$127.91	$127.91†	$127.91†	$117.82	$106.00
No. 2 Fdry, Pig Iron, GT	58.99	58.99	58.99	56.54	52.54
Basic Pig Iron, GT	58.49	58.49	58.49	56.04	52.16
Malleable Pig Iron, GT	59.77	59.77	59.77	57.27	53.27
Steelmaking Scrap, GT	50.50	51.50	52.17	35.25	48.00

†Revised.

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	Feb. 1 1956	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	4.65	4.65	4.65	4.30	3.70
Bars, H.R., Chicago	4.65	4.65	4.65	4.30	3.70
Bars, H.R., deld. Philadelphia	4.90	4.90	4.90	4.55	4.18
Bars, C.F., Pittsburgh	6.25*	6.25*	5.90	5.40	4.55
Shapes, Std., Pittsburgh	4.60	4.60	4.60	4.25	3.65
Shapes, Std., Chicago	4.60	4.60	4.60	4.25	3.65
Shapes, deld., Philadelphia	4.88	4.88	4.88	4.53	3.90
Plates, Pittsburgh	4.50	4.50	4.50	4.225	3.70
Plates, Chicago	4.50	4.50	4.50	4.225	3.70
Plates, Coatesville, Pa.	4.80	4.80	4.80	4.225	4.15
Plates, Sparrows Point, Md.	4.50	4.50	4.50	4.225	3.70
Plates, Claymont, Del.	4.80	4.80	4.80	4.225	4.15
Sheets, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.60-3.75
Sheets, H.R., Chicago	4.325	4.325	4.325	4.05	3.60
Sheets, C.R., Pittsburgh	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Chicago	5.325	5.325	5.325	4.95	4.35
Sheets, C.R., Detroit	5.325-5.425	5.325-5.425	5.325-5.425	5.10	4.55
Sheets, Galv., Pittsburgh	5.85	5.85	5.85	5.45	4.80
Strip, H.R., Pittsburgh	4.325	4.325	4.325	4.05	3.75-4.00
Strip, H.R., Chicago	4.325	4.325	4.325	4.05	3.50
Strip, C.R., Pittsburgh	6.25	6.25	6.25	5.75	4.65-5.35
Strip, C.R., Chicago	6.25-6.35	6.25-6.35	6.25-6.35	5.85	4.90
Strip, C.R., Detroit	6.35	6.35	6.35	5.90	4.35-5.60
Wire, Basic, Pittsburgh	6.60	6.60	6.25	5.75	4.85-5.10
Nails, Wire, Pittsburgh	7.60	7.60	7.60	6.85	5.90-6.20
Tin plate (1.50 lb), box, Pitts.	$9.45	$9.45	$9.45	$9.05	$8.70

*Including 0.35c for special quality.

SEMIFINISHED STEEL					
Billets, Forging, Pitts. (NT)	$84.50	$84.50	$84.50	$78.00	$66.00
Wire rods, ½-⅝" Pitts.	5.025-5.375	5.025-5.375	5.025	4.675	4.10-4.30

PIG IRON, Gross Ton					
Bessemer, Pitts.	$59.50	$59.50	$59.50	$57.00	$53.00
Basic, Valley	58.50	58.50	58.50	56.00	52.00
Basic, deld. Phila.	62.16	62.16	62.16	59.66	56.39
No. 2 Fdry, Pitts.	59.00	59.00	59.00	56.50	52.50
No. 2 Fdry, Chicago	59.00	59.00	59.00	56.50	52.50
No. 2 Fdry, Valley	59.00	59.00	59.00	56.50	52.50
No. 2 Fdry, deld. Phila.	62.66	62.66	62.66	55.16	56.89
No. 2 Fdry, Birm.	55.00	55.00	55.00	52.88	48.88
No. 2 Fdry (Birm.) deld. Cin.	62.70	62.70	62.70	60.58	55.58
Malleable, Valley	59.00	59.00	59.00	56.50	52.50
Malleable, Chicago	59.00	59.00	59.00	56.50	52.50
Ferromanganese, Duquesne	205.00†	205.00†	205.00†	190.00†	188.00*

†74-76% Mn, net ton. *75-82% Mn, gross ton, Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pitts.	$49.50	$50.50	$51.00	$35.75	$51.50
No. 1 Heavy Melt, E. Pa.	53.00	55.00	55.00	36.00	47.50
No. 1 Heavy Melt, Chicago	49.00	49.00	50.50	34.00	45.00
No. 1 Heavy Melt, Valley	54.50	54.50	57.50	36.50	51.25
No. 1 Heavy Melt, Cleve.	52.00	52.00	54.50	33.50	50.75
No. 1 Heavy Melt, Buffalo	47.50	47.50	45.50	30.50	51.50
Rails, Rerolling, Chicago	69.00	67.50	72.50	49.50	67.00
No. 1 Cast, Chicago	48.50	49.50	51.50	40.00	62.00

COKE, Net Ton					
Beehive, Furn, Connlsvl.	$14.125	$14.125	$14.125	$13.75	$14.75
Beehive, Fdry, Connlsvl.	16.50	16.50	16.50	16.75	17.50
Oven, Fdry, Chicago	27.00	27.00	27.00	24.50	21.00

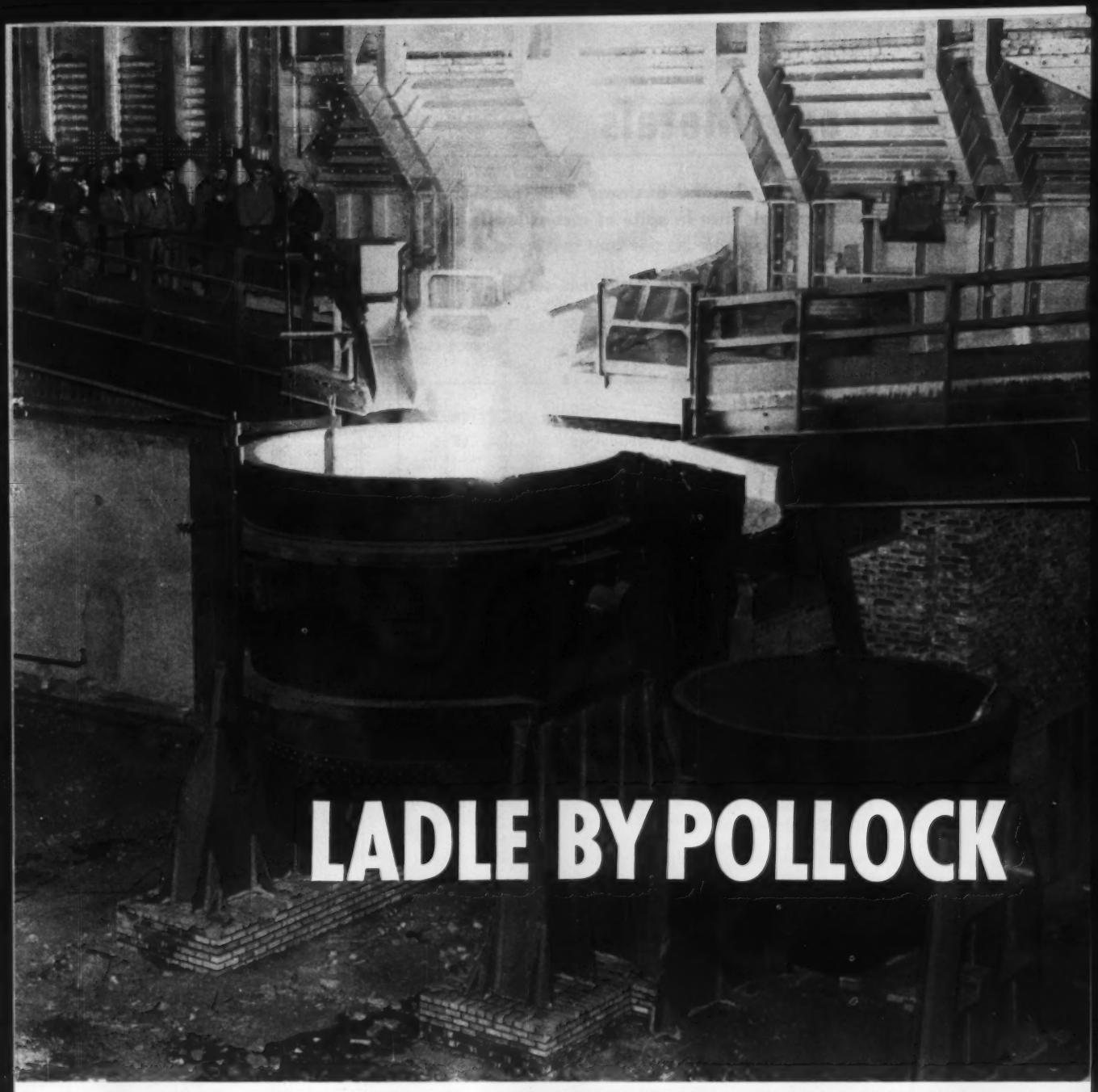
Daily Nonferrous Price Record

	Price Feb. 1	Last Change	Previous Price	Dec. Avg.	Nov. Avg.	Jan. 1955 Avg.
Copper	43.00–50.25	Dec. 29, 1955	43.00–50.00	46.053	44.420	30.180
Lead	15.80	Jan. 13, 1956	16.30	15.358	15.300	14.800
Zinc	13.50	Jan. 6, 1956	13.00	13.000	13.000	11.500
Tin	101.25	Feb. 1, 1956	101.00	107.98	97.825	87.280
Nickel	64.50	Nov. 24, 1954	60.00	64.500	64.500	64.500
Aluminum	24.40	Aug. 8, 1955	23.20–24.40	24.400	24.400	22.900
Magnesium	32.50	Aug. 16, 1955	28.50	32.500	32.500	27.000

Quotations in cents per pound based on: COPPER, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary ingots, 99 + %, deld.; MAGNESIUM, 99.8%, Freeport, Tex.

What You Can Use the Markets Section for:

- **A source of price information.**
  Current prices are reported each week. Price changes are shown in italics. Price trends are shown in tables of indexes and comparisons.
- **A directory of producing points.**
  Want to know who makes something, or where it is made? The steel price tables alphabetically list the cities of production and indicate the producing company. If you are a buyer, you may want to make a map showing comparative distances of sources of supply and to help you compute freight costs. If you are a seller of supplies you can make a map to spot your sales possibilities.
- **A source of price data for making your own comparisons.**
  Maybe you want to keep a continuous record of price spread between various forms of steel. You can get your base price information from STEEL's price tables.
- **A source of information on market trends.**
  Newsy items tell you about the supply-demand situation of materials, including iron and steel, nonferrous metals and scrap. Other articles analyze special situations of interest and importance to you.
- **Reports on iron and steel production, and materials and product shipments.**



More than half of the Nation's open hearth ladles built by Pollock.

This 268-ton open hearth ladle at the Portsmouth Division of Detroit Steel Corporation was designed and fabricated by The William B. Pollock Company. Pollock has more experience in engineering and building iron and steel plant equipment than any other company—92 years of it. Pollock engineers are at your service. Pollock facilities will handle everything from a 10-ton ladle to a complete blast furnace.

THE WILLIAM B. POLLOCK COMPANY

Since 1863

YOUNGSTOWN, OHIO

ENGINEERS • FABRICATORS • ERECTORS • STEEL PLATE CONSTRUCTION

BLAST FURNACES • HOT METAL CARS AND LADLES • CINDER AND SLAG CARS • INGOT MOULD CARS • CHARGING BOX CARS • WELDED OPEN HEARTH LADLES

Nonferrous Metals

Annual nickel survey by the Business & Defense Services Administration reveals that in spite of record levels of supply, nondefense users need 50 per cent more nickel

Nonferrous Metal Prices, Pages 166 & 167

THE DEFENSE department's requirements for nickel will be met. Industry demand will continue to grow. That's the gist of the Business & Defense Services Administration's annual nickel report.

Demand for nickel in all industry groups, particularly in electroplating, high-temperature and electrical-resistance alloys and nonferrous uses, will increase substantially, says the report.

Rundown — BDSA estimates that total industry requirements (including military) will be about 235 million lb during the year. This would be the minimum amount needed to keep industry at satisfactory levels. Anticipated demand: 300 million lb.

The report, based on surveys and conferences with industry representatives, points out that consuming industries are being damaged because of the uncertainty of nickel supplies. States the report: "Potential business enterprises requiring nickel are limited in scope . . . The growth of existing industries consuming nickel in an expanding economy is being seriously retarded."

Suggestion—The stockpile acquisition schedule for this year should be modified. The report says that if this were done it would be in the interest of maintaining the mobilization base as well as permitting some growth in industries dependent on nickel. While the completion of the stockpile would be delayed, the diversion to industry would permit the government to reduce its commitment to purchase nickel from government-sponsored producing facilities after the stockpile is completed, explains BDSA.

Finale—"As a growth industry, a level of 260-million-lb consumption by 1960 for nondefense business is desirable and attainable. The experience of 1955 indicates that the previous estimate of 240 million lb for 1960 was too low," reports BDSA.

GSA Enters Market

While the General Services Administration will get little more than token offers of lead and zinc, it is significant that GSA is willing to enter the market to buy the two metals at the combined price of 29.50 cents per pound. A spot check of producers by STEEL reveals that it is difficult to find anyone who will admit that he will sell GSA any lead or zinc. Point to remember: While little metal may go to the government stockpile, GSA has given a firm floor to lead and zinc.

STEEL's Metal Price Averages for Jan., 1956
(Cents per lb)

Electrolytic Copper, deld. Connecticut	46.700
Lead, St. Louis	15.960
Prime Western Zinc, E. St. Louis, Ill.	13.440
Straits Tin, New York	105.067
Primary Aluminum Ingots, deld.	24.400
Magnesium, Freeport, Tex.	32.500
Nickel, f.o.b. refinery	64.500

Meanwhile, sales of lead and zinc are satisfactory but not phenomenal. Lead sales, says one producer, are still better than a year ago but below November and December levels.

Tin Prices Dip

The tin market continues to bounce, but prices are gradually going down. While prices remain near the $1.02-cents-per-pound level, most observers feel that there could be further drops in price during the next two weeks.

There is another school of thought, too. When prices dipped on the London market last week, a Malayan strike threat sent the price back up. One rumor stated that the strike would come next week.

The Indonesian parliament was delayed making a decision on the International Tin Agreement which would pave the way for stabilized tin prices. Indonesia's approval is needed to get the program under way. Theoretically, when and if Indonesia agrees, a buffer agency would be set up. It would have money and tin supplied by members of the tin agreement. When the market reached a high point ($1 to $1.10 cents per pound), the agency could sell tin from the reserve to alleviate a temporary shortage. When the price dipped to the 80-to-90-cent level, it would then buy tin.

Many observers are dubious about the success of such a move. Reason: With tin selling at current levels, it would be difficult to get enough tin to set up such a reserve fund at this time. Market demand and supply are just about equal.

Copper Shortage Continues

While the producers of copper continue to talk of brightening prospects for the red metal, the immediate future (February, March) looks dark.

What was thought to be a "quickie" strike at the Laurel Hill refinery of Phelps Dodge is turning out to be a long walkout. Some 9000 tons of refined output has been lost.

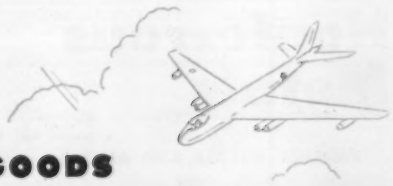
And on another copper front, the Senate Government Operations Investigations Subcommittee discloses it is investigating reports of illegal traffic in strategic materials. Reports have it that large shipments of copper wire (supposedly from Britain) are finding their way into communist-dominated areas.

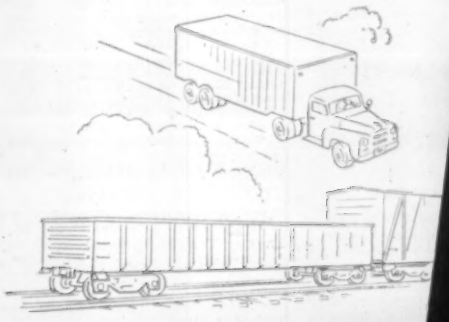
Market Memos

- Aluminum set aside for the second quarter will amount to 150 million lb. This, says BDSA, will assure the delivery of enough metal to meet Defense department and Atomic Energy Commission requirements for both A and B products. This is a 5-million-lb increase over the take for the first quarter. The cause: Increased military orders, explains BDSA.
- St. Joseph Lead Co. will not enter the aluminum field unless the government will offer fast tax write-offs. While experts feel that St. Joe will eventually enter the aluminum field, consensus is that the project is dormant at the present time.
- Stockholders of Reynolds Metals Co. have authorized the issue of 2 million shares of cumulative prefered stock. Par value: $50 per share.

Newport Steel

DELIVERS THE GOODS





Distribution is just as important in the great American economy as production itself. Newport Steel products are in there performing essential and very satisfactory service for both producer and carrier, even though product identity may be lost. With a background of seventy years of quality steelmaking, Newport today augments the skill of its personnel with the most modern facilities and methods. And adds an extra value by its location right in the heart of today's greatest industrial expansion. Newport Steel continues to grow with the amazing development of this area.

PRODUCTS OF NEWPORT STEEL

Cold-Rolled Sheets
Hot-Rolled Steel in Coil
Hot-Rolled Pickled Steel in Coil
Hot-Rolled Sheets
Hot-Rolled Pickled Sheets
Galvanized Sheets
Galvannealed Sheets
Colorbond Sheets
Electrical Sheets
Alloy Sheets and Plates
Electric Weld Line Pipe
Roofing and Siding
Eave Trough and Conductor Pipe
Culverts

ECONOMICAL WATERAIL-TRUCK DELIVERY

Newport Steel is ideally situated on the Mississippi-Ohio River system and the great Cincinnati rail-truck hub. New barge facilities, 7 major railroads, 143 motor carriers enable Newport to give economical, dependable delivery to the entire area of the Middle West and South.

Newport Steel

CORPORATION

NEWPORT, KENTUCKY

YOUR CONFIDENCE IS JUSTIFIED WHERE THIS FLAG FLIES

A SUBSIDIARY OF MERRITT-CHAPMAN & SCOTT CORPORATION

Nonferrous Metals

Cents per pound, carlots, except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99 + %, ingots, 24.40; pigs 22.50. 10,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 12% Si, 26.20; No. 43, 5% Si, 26.00; No. 142, 4% Cu, 1.5% Mg, 2% Ni, 28.20; No. 195, 4.5% Cu, 0.8% Si, 27.60; No. 214, 3.8% Mg, 27.80; No. 356, 7% Si, 0.3% Mg, 26.20.

Antimony: R.M.M. brand, 99.5%, 33.00, Lone Star brand, 33.50, f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 27.00-28.00, New York, duty paid, 10,000 lb or more.

Beryllium: 97%, lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $72.75 per lb of contained Be, f.o.b. Reading, Pa., Elmore, O.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. Reading, Pa., or Elmore, O.

Bismuth: $2.25 per lb ton lots.

Cadmium: Sticks and bars $1.70 per lb, deld.

Cobalt: 97-99%, $2.60 per lb for 550-lb keg; $2.62 per lb for 100-lb case; $2.67 per lb under 100 lb.

Columbium: Powder, $119.20 per lb, nom.

Copper: Electrolytic, 43.00 deld. Conn. Valley; 43.00 deld. Midwest; custom smelters, 50.50-51.00 deld.; Lake, 43.00 deld.; Fire refined, 42.75 deld.

Germanium: First reduction, $201.85-$220 per lb; intrinsic grade, $220-$242.67 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $100-$120 nom, per troy oz.

Lead: Common, 15.80; chemical, 15.90; corroding, 15.90, St. Louis. New York basis, add 0.20.

Lithium: 99%+, cups or ingots, $11.50; rod $13.50; shot or wire, $14.50, f.o.b. Minneapolis, 100 lb lots.

Magnesium: 99.8% self-palletizing pig, 32.50; notched ingot, 32.25, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40 for pig and 1.45 for ingot; for Madison, Ill., add 1.20 for pig and 1.25 for ingot; for Los Angeles, add 2.00 for both pig and ingot. Sticks 1.3 in. diameter, 53.00, 100 to 4999 lb, f.o.b. Madison, Ill.

Magnesium Alloys: AZ91C and alloys C, G, H and R, 36.00; alloy M, 38.00, 10,000 lb or more, f.o.b. Freeport, Tex. For Port Newark, N. J., add 1.40; for Madison, Ill., add 0.50; for Los Angeles, add 2.50. AZ91B, 31.00, Madison, Ill.

Mercury: Open market, spot, New York, $271-$275 per 76-lb flask.

Molybdenum: Powder 99% hydrogen reduced, $3-$3.35 per lb; pressed ingot, $4.06 per lb; sintered ingot, $5.53 per lb.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 64.50; 10-lb pigs, unpacked, 67.65; "XX" nickel shot, 69.00; "F" nickel shot or ingots for addition to cast iron, 64.50; prices f.o.b. Port Colborne, Ont., including import duty. New York basis, add 0.92.

Osmium: $80-$100, nom, per troy oz.

Palladium: $22-$24 per troy oz.

Platinum: $97-$112 per troy oz from refineries.

Radium: $16-$21.50 per mg radium content, depending on quantity.

Rhodium: $118-$125 per troy oz.

Ruthenium: $45-$55 per troy oz.

Selenium: 99.5%, $13.50-$15.50 per lb.

Silver: Open market, 90.00 per troy oz.

Sodium: 16.50, c.l.; 17.00 l.c.l.

Tantalum: Sheet, rod, $68.70 per lb; powder, $56.63 per lb.

Tellurium: $1.50-$1.75 per lb.

Thallium: $12.50 per lb.

Tin: Straits, N. Y., spot, 101.25; prompt, 101.

Titanium: Sponge, 99.3+%, grade A-1 ductile (0.3% Fe max), $3.45; grade A-2 (0.5% Fe max), $3.15 per pound.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $4.30 per lb, nom., f.o.b. shipping point; less than 1000 lb add 15.00; 99 + % hydrogen reduced, $5.00. Treated ingot, $6.70.

Zinc: Prime Western, 13.50; brass special, 13.75; intermediate, 14.00, East St. Louis, freight allowed over 0.50 per pound. High grade, 14.85; special high grade, 15.25 deld. Diecasting alloy ingot No. 3, 18.00; No. 2, 19.00; No. 5, 18.50, deld.

Zirconium: Ingots, commercial grade, $14.40 per lb; low-hafnium reactor grade, $23.07. Sponge, commercial grade, $7.50-$10.00 per lb, depending on quantity; reactor grade, $14.00-$22.00 per lb, depending on quantity. Powder, electronics grade, $15 per lb; flash grade, $11.50.

(Note: Chromium, manganese and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 31.75-33.50; No. 12 foundry alloy (No. 2 grade) 30.50-30.75; 5% silicon alloy, 0.60 Cu max, 32.00-32.25; 13 alloy, 0.60 Cu max, 32.00-32.25; 195 alloy, 32.00-32.25; 108 alloy 30.50. Steel deoxidizing grades notch bars, granulated or shot: Grade 1, 31.25-31.75; grade 2, 30.75; grade 3, 30.00; grade 4, 28.50-29.50.

Brass Ingot: Red brass No. 115, 42.00; tin bronze No. 225, 56.00; No. 245, 48.75; high-leaded tin bronze No. 305, 45.75; No. 1 yellow No. 405, 33.25; manganese bronze No. 421, 37.75.

Magnesium Alloy Ingot: AZ63A, 34.00; AZ91B, 34.00; AZ91C, 34.00; AZ92A, 34.00.

NONFERROUS MILL PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb, f.o.b. Temple, Pa.; nominal 1.9% Be alloy) Strip, $1.84; rod, bar, wire, $1.81.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 100,000-lb lots, 48.35; 30,000-lb lots 48.88; l.c.l., 48.98. Weatherproof, 100,000-lb lots, 46.03; 30,000-lb lots, 46.28; l.c.l. 46.78. Magnetic wire deld., 15,000 lb or more, 55.52; l.c.l., 56.27.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh) Sheets, full rolls, 140 sq ft or more, $21.50 per cwt; pipe, full coils, $21.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $13.10-$13.60; sheared mill plate, $10.50-$12.00; strip, $13.10-$13.60; wire, $9.50-$11.50; forging billets, $7.90-$8.15; hot-rolled and forged bars, $7.90-$8.15.

ZINC

(Prices per lb, c.l., f.o.b. mill) Sheets, 23.00-24.00; ribbon zinc in coils, 20.50-21.50; plates, 20.00-22.25.

ZIRCONIUM

Plate, $22; H.R. strip, $19; C.R. strip, $29; forged or H.R. bars, $17; wire, 0.015 in., 1.00c per linear foot.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	102	83	99
Strip, C.R.	102	92	125
Plate, H.R.	97	87	95
Rod, Shapes, H.R.	87	74	93
Seamless Tubes	122	110	153
Shot, Blocks	...	71	...

ALUMINUM

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	67.9	66.4	...	...
0.156-0.172	57.5	55.9	...	...
0.188	57.5	55.9	...	71.7
0.219-0.234	54.5	52.9	...	...
0.250-0.281	54.5	52.9	...	68.4
0.313	54.5	52.9	...	65.2
Cold-finished				
0.375-0.547	53.4	51.4	63.7	61.3
0.563-0.688	53.4	51.4	60.6	57.5
0.750-1.000	52.1	50.1	55.4	54.2
1.063	52.1	50.1	...	52.3
1.125-1.500	50.1	48.2	53.6	52.3
Rolled				
1.563	48.8	46.9	...	...
1.625-2.000	48.2	46.2	...	50.5
2.125-2.500	47.0	45.0	...	...
2.563-3.375	45.6	43.6	...	...

ALUMINUM

Sheet and Circles: 1100 and 3003 mill finish (30,000 lb base; freight allowed)

Thickness Range Inches	Flat Sheet	Flat Sheet Circles*	Coiled Sheet	Coiled Sheet Circle†
0.249-0.136	37.5	42.3	...	...
0.135-0.096	38.0	43.2	...	...
0.095-0.077	38.7	44.2	36.1	41.3
0.076-0.061	39.3	45.1	36.3	41.5
0.060-0.048	39.9	45.6	36.7	42.0
0.047-0.038	40.4	46.5	37.2	42.4
0.037-0.030	40.8	47.0	37.6	43.1
0.029-0.024	41.4	47.5	37.9	43.6
0.023-0.019	42.2	49.0	38.8	44.5
0.018-0.017	43.0	...	39.4	45.4
0.016-0.015	43.9	...	40.2	46.6
0.014	44.9	...	41.2	47.9
0.013-0.012	46.1	...	41.9	48.9
0.011	47.1	...	43.1	50.5
0.010-0.0095	48.4	...	44.3	52.2
0.009-0.0085	49.7	...	45.8	54.3
0.008-0.0075	51.3	...	47.0	56.1
0.007	52.8	...	48.5	58.4
0.006	54.4	...	49.9	63.4

*48 in. max diam. †26 in. max diam.

ALUMINUM

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam, 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	36.5	40.8
5050-F	37.6	41.9
3004-F	38.6	43.8
5052-F	39.9	45.2
6061-T6	41.1	46.0
2024-T4*	43.6	49.9
7075-T6*	51.4	58.5

*24-48 in. widths or diam, 72-180 lengths.

ALUMINUM

Forging Stock: Round, Class 1, 39.10-50.10 in specific lengths 36-144 in., diameters 0.375-8 in. Rectangles and squares, Class 1, 43.00-56.20 in random lengths, 0.375-4 in. thick, widths 0.750-10 in.

Pipe: ASA Schedule 40, alloy 6063-T6, 20-ft lengths, plain ends, 90,000-lb base, per 100 ft.

Nom. Pipe Size (in.)		Nom. Pipe Size (in.)	
⅜	$16.85	2	$ 51.95
1	26.50	4	143.00
1¼	35.85	6	256.70
1½	42.90	8	386.30

MAGNESIUM

Sheet: AZ31, commercial grade, 0.032 in., 99.00; 0.064 in., 78.00; 0.125 in., 63.50, 30,000 lb and over, f.o.b. mill.

Plate: AZ31, 61.00, 30,000 lb or more, 0.250 in. and over, widths 24-60 in., lengths 72-180 in., tread plate, 64.00, 30,000 lb or more, ¼-in. thick, widths 24-60 in., lengths 60-192 in.; tooling plate 66.00, 30,000 lb or more, 0.250-3.000 in., widths 60-72 in., lengths 72-180 in.

Extrusions: AZ31 commercial grade, rectangles, ¼ x 2 in., 64.70; 1 x 4 in., 69.50. Rod, 1 in., 61.50; 2 in., 59.00. Tubing, 1 in. OD x 0.065 in., 82.50. Angles, 1 x 1 x ⅛-in., 68.40; 2 x 2 x ¼-in., 62.50. Channels, 5 in., 63.40. I-beams, 5 in., 62.70.

NONFERROUS SCRAP

DEALERS BUYING PRICES

(Cents per pound, New York, in ton lots)

Aluminum: 1100 clippings, 20.50-21.00; old sheets, 17.00-17.50; borings and turnings, 11.00-11.50; crankcases, 17.00-17.50; industrial castings, 17.00-17.50.

Copper and Brass: No. 1 heavy copper and wire, 41.50-42.00; No. 2 heavy copper and wire, 37.50-38.00; light copper, 35.00-35.50; No. 1 composition red brass, 31.50-32.00; No. 1 composition turnings, 30.50-31.00; yellow

BRASS MILL PRICES

	MILL PRODUCTS a			SCRAP ALLOWANCES f			
	Sheet, Strip, Plate	Rod	Wire	Seamless Tube	Clean Heavy	Rod Ends	Clean Turnings
Copper	63.13-64.13b	60.36-61.36c	....	63.32-64.32	39.000	39.000	38.250
Yellow Brass	52.27-53.60	42.81-43.80d	52.81-54.14	55.18-56.51	29.250	29.000	27.125
Low Brass, 80%	56.55-57.75	56.49-57.69	57.09-58.29	59.36-60.56	34.375	34.125	33.625
Red Brass, 85%	58.09-59.24	58.03-59.18	58.63-59.78	60.90-62.05	34.250	34.000	33.500
Com. Bronze, 90%	60.18-61.28	60.12-61.22	60.72-61.82	62.74-63.84	35.750	35.500	35.000
Manganese Bronze	59.37-60.92	53.38-54.86	63.82	....	27.500	27.250	26.750
Muntz Metal	53.74-55.14	49.55-50.95	....	....	27.375	27.125	26.625
Naval Brass	55.63-57.10	49.94-51.41	62.69-64.16	58.79-60.26	27.125	26.875	26.375
Silicon Bronze	66.54	65.73	66.58	68.68e	37.875	37.625	37.875
Nickel Silver, 10%	66.00-67.25	68.33g	68.33	....	32.750	32.500	16.375
Phos. Bronze, A, 5%	80.99-82.52	81.49-83.02	81.49-83.02	82.67-84.20	39.750	39.500	38.500

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. 3% silicon. f. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, of any or all kinds of scrap, add 1 cent per lb. Where price spread exists, we quote the upper range. g. Leaded

brass turnings, 16.50-17.00; new brass clippings, 27.50-28.00; light brass, 19.00-19.50; heavy yellow brass, 22.00-22.50; new brass rod ends, 26.00-26.50; auto radiators, unsweated, 24.00-24.50; cocks and faucets, 24.50-25.00; brass pipe 25.00-25.50.

Lead: Heavy, 12.75-13.25; battery plates, 7.00-7.25; linotype and stereotype, 14.00-14.50; electrotype, 13.25-13.75; mixed babbitt, 15.50.

Magnesium: Clippings, 18.50-19.50; clean castings, 18.00-19.00; iron castings, not over 10% removable Fe, less full deduction for Fe, 16.00-17.00.

Monel: Clippings, 60.00-65.00; old sheets, 55.00-65.00; turnings, 50.00; rods, 59.50-65.00.

Nickel: Sheets and clips, 100.00-150.00; rolled anodes, 100.00-150.00; turnings, 85.00-125.00; rod ends, 100.00-150.00.

Zinc: Old zinc, 6.00-6.50; new die-cast scrap, 6.00; old die-cast scrap, 3.50.

REFINER'S BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Aluminum: 1100 clippings, 23.00; 3003 clippings, 22.75-23.00; 6151 clippings, 22.50-23.00; 5052 clippings, 22.50-23.00; 2014 clippings, 22.00-22.50; 2017 clippings, 22.00-22.50; 2024 clippings, 22.00-22.50; mixed clippings, 22.00-22.50; old sheet, 19.00-20.00; old cast, 19.00-20.00; clean old cable (free of steel), 23.00; borings and turnings, 20.00-21.00.

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 54.00; light scrap, 49.00; turnings and borings, 34.00-39.00.

Copper and Brass: No. 1 heavy copper and wire, 41.50; No. 2 heavy copper and wire, 40.00; light copper 37.75; refinery brass (60% copper) per dry copper content, 38.00.

INGOTMAKERS' BUYING PRICES

(Cents per pound, carlots, delivered)

Copper and Brass: No. 1 heavy copper and wire, 41.50; No. 2 heavy copper and wire, 40.00; light copper, 37.75; No. 1 composition borings, 33.00; No. 1 composition solids, 34.00; heavy yellow brass solids, 23.00; yellow brass turnings, 22.00; radiators, 26.00.

PLATING MATERIAL

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.70 per lb.

Copper: Flat-rolled, 59.79-60.79 oval 58.92, 5000-10,000 lb; electrodeposited, 57.75, 2000-5000 lb lots; cast 59.54, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, $1.015; 100-499 lb, 99.50; 500-4999 lb, 95.50; 5000-29,999 lb, 93.50; 30,000 lb, 91.50. Carbonized, deduct 3 cents a lb. All prices eastern delivery effective Jan. 1, 1955.

Tin: Bar or slab; less than 200 lb, $1.195; 200-499 lb, $1.180; 500-999 lb, $1.175; 1000 lb or more, $1.170.

Zinc: Balls, 21.00; flat tops, 21.00; flats, 22.75; ovals, 22.00, ton lots.

CHEMICALS

Cadmium Oxide: $2.15 per lb, in 100-lb drums.

Chromic Acid: Less than 10,000 lb, 28.50; over 10,000 lb, 27.50.

Copper Cyanide: 100 lb, 85.25; 200 lb, 84.50; 300 lb, 84.25; 400-900 lb, 85.50; 1000 lb, 81.50.

Copper Sulphate: 500-1900 lb, 17.90; 2000-5900 lb, 15.90; 6000 lb or more, 15.65.

Nickel Chloride: 100 lb, 46.50; 200 lb, 44.50; 300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 39.50; 10,000 lb and over, 38.50. All prices eastern delivery, effective Jan. 1, 1955.

Nickel Sulphate: 100 lb, 38.25; 200 lb, 36.25; 3300 lb, 35.25; 400-4900 lb, 33.25; 5000-35,900 lb, 31.25; 36,000 lb, 30.25. All prices eastern delivery, effective Jan. 1, 1955.

Silver Cyanide: (Cents per ounce) 4-oz bottle, 86.875; 16-oz bottle, 85.625; 80-oz bottle, 83.125; 100-oz bottle, 83.125; f.o.b. St. Louis, New York and Los Angeles. Effective Sept. 30, 1955.

Sodium Cyanide: Egg, under 1000 lb, 19.80; 1000-19,900 lb, 18.80; 20,000 lb, and over, 17.80; granular, add 1-cent premium to above.

Sodium Stannate: Less than 100 lb, 71.90; 100-600 lb, 63.40; 700-1900 lb, 60.90; 2000-9900 lb, 59.20; 10,000 lb or more, 58.00.

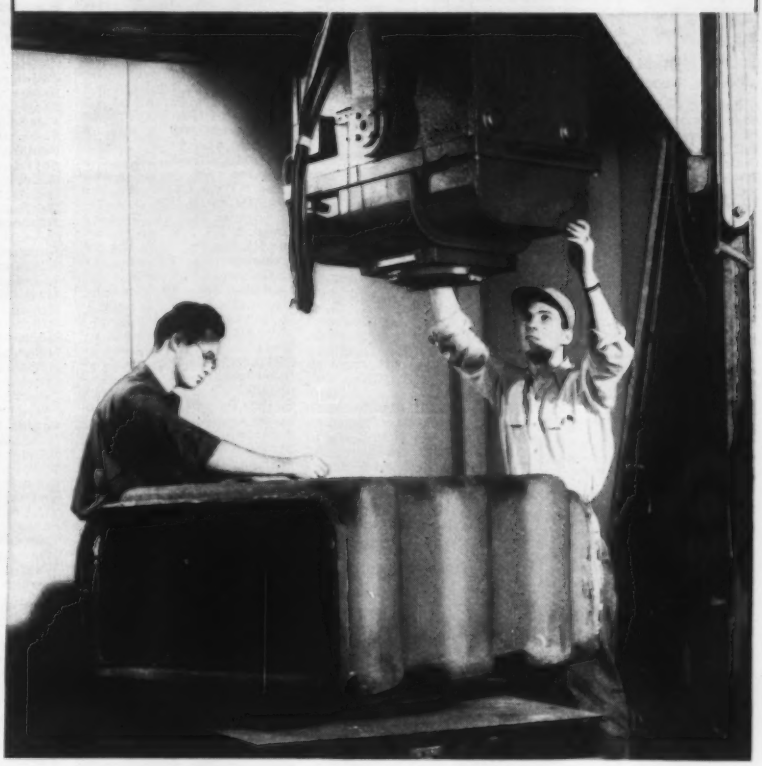
Stannous Chloride (anhydrous): Less than 25 lb, $1.690; 25 lb, $1.340; 100 lb, $1.190; 400 lb, $1.165; 5200-19,600 lb, $1.043; 20,000 lb or more, 92.10.

Stannous Sulphate: Less than 50 lb, $1.316; 50 lb, $1.016; 100-1900 lb, 99.60; 2000 lb or more, 97.60.

Zinc Cyanide: Under 1000 lb, 54.30; 1000 lb and over, 52.30.

THERMALLOY* quality control at work

private eye



We put the eye on your castings to cut heat-treat costs

Thermalloy castings such as pots and muffles are *completely X-rayed* throughout; other castings are X-rayed where experience has shown that abnormal conditions can be expected. All tests are conducted by trained radiographers.

X-ray testing is just one phase of Electro-Alloys research and quality control. Our Elyria plant has a completely equipped metallurgical laboratory for study of heat and abrasion problems encountered by our field engineers.

Let us put our facilities to work to solve your heat-treat problems. Call your local Electro-Alloys representative, or write for a copy of booklet T-225, *Thermalloy Heat-Resistant Castings Give Longer Service Life*. Electro-Alloys Division, 7007 Taylor Street, Elyria, Ohio.

*Reg. U. S. Pat. Off.—designating not just one but a *group* of alloys, each developed to meet a specific heat and abrasion problem.

Heat-Resistant Castings · Trays · Muffles · Retorts · Conveyor Belts · Radiant Tubes

AMERICAN Brake Shoe COMPANY

ELECTRO-ALLOYS DIVISION
Elyria, Ohio

Steel Prices

Mill prices as reported to STEEL, cents per pound except as otherwise noted. *Changes shown in italics.* Code numbers following mill points indicate producing company. Key on page 169. Key to footnotes, page 171.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)

Munhall,Pa. U5 .....$65.50

INGOTS, Alloy (NT)

Detroit R7 .....$69.00
Houston S5 .....74.00
Midland,Pa. C18 .....69.00
Munhall,Pa. U5 .....69.00

BILLETS, BLOOMS & SLABS

Carbon, Rerolling (NT)

Aliquippa,Pa. J5 .....$68.50
Bessemer,Pa. U5 .....68.50
Bridgeport Conn. N19 ..73.50
Buffalo R2 .....68.50
Clairton,Pa. U5 .....68.50
Ensley,Ala. T2 .....68.50
Fairfield,Ala. T2 .....68.50
Fontana,Calif. K1 .....76.00
Gary,Ind. U5 .....68.50
Johnstown,Pa. B2 .....68.50
Lackawanna,N.Y. B2 ..68.50
LoneStar,Tex. L6 .....74.50
Munhall,Pa. U5 .....68.50
Pittsburgh J5 .....68.50
S.Chicago,Ill. R2, U5..68.50
S.Duquesne,Pa. U5 ....68.50
Youngstown R2 .....68.50

Carbon, Forging (NT)

Aliquippa,Pa. J5 ....$84.50
Bessemer,Pa. U5 .....84.50
Bridgeport,Conn. N19 . 89.50
Buffalo R2 .....84.50
Canton,O. R2 .....86.50
Clairton,Pa. U5 .....84.50
Conshohocken,Pa. A3.. 89.50
Ensley,Ala. T2 .....84.50
Fairfield,Ala. T2 .....84.50
Fontana,Calif. K1 .....92.00
Gary,Ind. U5 .....84.50
Geneva,Utah C11 .....84.50
Houston S5 .....89.50
Johnstown,Pa. B2 .....84.50
Lackawanna,N.Y. B2..84.50
LosAngeles B3 .....94.00
Midland,Pa. C18 .....84.50
Munhall,Pa. U5 .....84.50
Pittsburgh J5 .....84.50
Seattle B3 .....98.00
S.Chicago R2,U5,W14 ..84.50
S.Duquesne,Pa. U5 ....84.50
S.SanFrancisco B3 ....94.00

Alloy, Forging (NT)

Bethlehem,Pa. B2 ....$96.00
Buffalo R2 .....96.00
Canton,O. R2, T7 .....96.00
Conshohocken,Pa. A3..103.00
Detroit R7 .....96.00
Fontana,Calif. K1 ....115.00
Gary,Ind. U5 .....96.00
Houston S5 .....101.00
Ind.Harbor,Ind. Y1 ...96.00
Johnstown,Pa. B2 .....96.00
Lackawanna,N.Y. B2 ..96.00
LosAngeles B3 .....116.00
Massillon,O. R2 .....96.00
Midland,Pa. C18 .....96.00
Munhall,Pa. U5 .....96.00
S.Chicago R2,U5,W14..96.00
S.Duquesne,Pa. U5 ....96.00
Struthers,O. Y1 .....96.00
Warren,O. C17 .....96.00

ROUNDS, SEAMLESS TUBE (NT)

Buffalo R2 .....$103.50
Canton,O. R2 .....103.50
Cleveland R2 .....103.50
Gary,Ind. U5 .....103.50
S.Chicago R2, W14 ...103.50
S.Duquesne,Pa. U5 ...103.50

SKELP

Aliquippa,Pa. J5 .....4.325
LoneStar,Tex. L6 .....4.625
Munhall,Pa. U5 .....4.225
SparrowsPoint,Md. B2..4.225
Warren,O. R2 .....4.225
Youngstown R2, U5 ...4.225

WIRE RODS

AlabamaCity,Ala. R2 ..5.375
Aliquippa,Pa. J5 .....5.375
Alton,Ill. L1 .....5.55
Buffalo W12 .....5.375
Cleveland A7 .....5.375
Donora,Pa. A7 .....5.375
Fairfield,Ala. T2 .....5.375
Houston S5 .....5.625
IndianaHarbor,Ind. Y1..5.375
Johnstown,Pa. B2 .....5.375
Joliet,Ill. A7 .....5.375
KansasCity,Mo. S5 ....5.625
Kokomo,Ind. C16 .....5.475
LosAngeles B3 .....6.175
Minnequa,Colo. C10 ...5.625
Monessen,Pa. P7 .....5.375
N.Tonawanda,N.Y. B11 5.375
Pittsburg,Calif. C11 ...5.675
Portsmouth,O. P12 .....5.375
Roebling,N.J. R5 .....5.475
S.Chicago,Ill. R2 .....5.375
SparrowsPoint,Md. B2..5.475
Sterling,Ill.(1) N15 ....5.375
Sterling,Ill. N15 .....5.475
Struthers,O. Y1 .....5.375
Worcester,Mass. A7 ...5.675

STRUCTURALS

Carbon Steel Std. Shapes

Ala.City,Ala. R2 .....4.60
Aliquippa,Pa. J5 .....4.60
Bessemer,Ala. T2 .....4.60
Bethlehem,Pa. B2 .....4.65
Birmingham C15 .....5.10
Clairton,Pa. U5 .....4.60
Fairfield,Ala. T2 .....4.60
Fontana,Calif. K1 .....5.25
Gary,Ind. U5 .....4.60
Geneva,Utah C11 .....4.60
Houston S5 .....4.70
Ind.Harbor,Ind. I-2 ....4.60
Johnstown,Pa. B2 .....4.65
KansasCity,Mo. S5 .....4.70
Lackawanna,N.Y. B2 ..4.65
LosAngeles B3 .....5.30
Minnequa,Colo. C10 ....4.90
Munhall,Pa. U5 .....4.60
Niles,Calif. P1 .....5.25
Portland,Oreg. O4 .....5.35
Phoenixville,Pa. P4 ....5.15
Seattle B3 .....5.35
S.Chicago U5, W14 .....4.60
S.SanFrancisco B3 ....5.25
Torrance,Calif. C11 ....5.30
Weirton,W.Va. W6 .....4.60

Wide Flange

Bethlehem,Pa. B2 .....4.65
Clairton,Pa. U5 .....4.60
Fontana,Calif. K1 .....5.40
Lackawanna,N.Y. B2 ..4.65
Munhall,Pa. U5 .....4.60
Phoenixville,Pa. P4 ....5.15
S.Chicago,Ill. U5 .....4.60

Alloy Std. Shapes

Clairton,Pa. U5 .....5.65
Fontana,Calif. K1 .....7.30
Gary,Ind. U5 .....5.65
Houston S5 .....5.75
Munhall,Pa. U5 .....5.65
S.Chicago,Ill. U5 .....5.65

H.S., L.A. Std. Shapes

Aliquippa,Pa. J5 .....6.75
Bessemer,Ala. T2 .....6.75
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.75
Fairfield,Ala. T2 .....6.75
Fontana,Calif. K1 .....7.40
Gary,Ind. U5 .....6.75
Geneva,Utah C11 .....6.75
Houston S5 .....6.85
Ind.Harbor,Ind. I-2, Y1.6.75
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 .....6.85
Lackawanna,N.Y. B2 ..6.80
LosAngeles B3 .....7.45
Munhall,Pa. U5 .....6.75
Seattle B3 .....7.50
S.Chicago,Ill. U5, W14..6.75
S.SanFrancisco B3 .....7.40
Struthers,O. Y1 .....6.75

H.S., L.A. Wide Flange

Bethlehem,Pa. B2 .....6.80
Lackawanna,N.Y. B2 ..6.80
Munhall,Pa. U5 .....6.75
S.Chicago,Ill. U5 .....6.75

PILING

BEARING PILES

Bethlehem,Pa. B2 .....4.65
Lackawanna,N.Y. B2 ..4.65
Munhall,Pa. U5 .....4.60
S.Chicago,Ill. U5 .....4.60

STEEL SHEET PILING

Ind.Harbor,Ind. I-2 ....5.45
Lackawanna,N.Y. B2 ....5.45
Munhall,Pa. U5 .....5.45
S.Chicago,Ill. U5 .....5.45

PLATES

PLATES, Carbon Steel

Ala.City,Ala. R2 .....4.50
Aliquippa,Pa. J5 .....4.50
Ashland,Ky.(15) A10 ...4.50
Bessemer,Ala. T2 .....4.50
Bridgeport,Conn. N19 ..4.75
Buffalo R2 .....4.50
Clairton,Pa. U5 .....4.50
Claymont,Del. C22 .....4.80
Cleveland J5, R2 .....4.60
Coatesville,Pa. L7 .....4.80
Conshohocken,Pa. A3 ...4.50
Detroit M1 .....4.60
Ecorse,Mich. G5 .....4.60
Fairfield,Ala. T2 .....4.50
Fontana,Calif.(30) K1 ..5.15
Gary,Ind. U5 .....4.50
Geneva,Utah C11 .....4.50
GraniteCity,Ill. G4 .....4.70
Harrisburg,Pa. P4 .....5.10
Houston S5 .....4.60
Ind.Harbor,Ind. I-2, Y1.4.50
Johnstown,Pa. B2 .....4.50
Lackawanna,N.Y. B2 ...4.50
LoneStar,Tex. L6 .....4.85
Mansfield,O. E6 .....4.50
Minnequa,Colo. C10 ....5.35
Munhall,Pa. U5 .....4.50
Newport,Ky. N9 .....4.50
Pittsburgh J5 .....4.50
Riverdale,Ill. A1 .....4.725
Seattle B3 .....5.40
Sharon,Pa. S3 .....4.50
S.Chicago R2, U5, W14.4.50
SparrowsPoint,Md. B2 ..4.50
Steubenville,O. W10 ....4.50
Warren,O. R2 .....4.50
Weirton,W.Va. W6 .....4.50
Youngstown R2, U5, Y1.4.50

PLATES, Carbon Abras. Resist.

Claymont,Del. C22 .....5.65
Fontana,Calif. K1 .....6.30
Geneva,Utah C11 .....5.65
Johnstown,Pa. B2 .....5.65
SparrowsPoint,Md. B2 ..5.65

PLATES, Wrought Iron

Economy,Pa. B14 .....10.40

PLATES, High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.725
Bessemer,Ala. T2 .....6.725
Clairton,Pa. U5 .....6.725
Cleveland J5, R2 .....6.725
Claymont,Del. C22 .....6.725
Coatesville,Pa. L7 .....7.025
Conshohocken,Pa. A3 ..6.725
Ecorse,Mich. G5 .....6.825
Fairfield,Ala. T2 .....6.725
Fontana,Calif.(30) K1..7.375
Gary,Ind. U5 .....6.725
Geneva,Utah C11 .....6.725
Houston S5 .....6.825
Ind.Harbor,Ind. I-2, Y1.6.725
Johnstown,Pa. B2 .....6.725
Munhall,Pa. U5 .....6.725
Pittsburgh J5 .....6.725
Seattle B3 .....7.625
Sharon,Pa. S3 .....6.725
S.Chicago,Ill. U5, W14.6.725
SparrowsPoint,Md. B2..6.725
Youngstown U5, Y1 ...6.725

PLATES, Alloy

Bridgeport,Conn. N19 ...6.55
Claymont,Del. C22 .....6.30
Coatesville,Pa. L7 .....6.30
Fontana,Calif. K1 .....6.95
Gary,Ind. U5 .....6.30
Houston S5 .....6.40
Ind.Harbor,Ind. Y1 ....6.30
Johnstown,Pa. B2 .....6.30
Munhall,Pa. U5 .....6.30
Newport,Ky. N9 .....6.30
Seattle B3 .....7.20
Sharon,Pa. S3 .....6.30
S.Chicago,Ill. U5, W14..6.30
SparrowsPoint,Md. B2 ..6.30
Youngstown Y1 .....6.30

FLOOR PLATES

Cleveland J5 .....5.575
Conshohocken,Pa. A3 ..5.575
Harrisburg,Pa. P4 .....5.575
Ind.Harbor,Ind. I-2 ...5.575
Munhall,Pa. U5 .....5.575
S.Chicago,Ill. U5 .....5.575

PLATES, Ingot Iron

Ashland c.l. (15) A10...4.75
Ashland l.c.l. (15) A10..5.25
Cleveland c.l. R2 .....5.10
Warren,O. c.l. R2 .....5.10

BARS

BARS, Hot-Rolled Carbon

Ala.City,Ala.(9) R2 ....4.65
Aliquippa,Pa.(9) J5 ....4.65
Alton,Ill. L1 .....4.85
Atlanta A11 .....4.85
Bessemer,Ala.(9) T2 ....4.65
Birmingham C15 .....5.15
Bridgeport,Conn. N19 ..4.80
Buffalo(9) R2 .....4.65
Canton,O.(9) R2 .....4.75
Clairton,Pa.(9) U5 ....4.65
Cleveland(9) R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala.(9) T2 ....4.65
FairlessHills,Pa.(9) U5..4.80
Fontana,Calif. K1 .....5.35
Gary,Ind.(9) U5 .....4.65
Houston(9) S5 .....4.90
Ind.Harbor,Ind.(9) I-2..4.65
Ind.Harbor,Ind. Y1 ....4.65
Johnstown,Pa. B2 .....4.65
Joliet,Ill. P22 .....5.15
KansasCity,Mo.(9) S5 ..4.90
Lackawanna,N.Y. B2 ...4.65
LosAngeles B3 .....5.35
Massillon,O.(9) R2 ....4.75
Midland,Pa. C18 .....4.65
Milton,Pa. M18 .....4.80
Minnequa,Colo. C10 ....5.10
Niles,Calif. P1 .....5.35
N.T'wanda,N.Y.(9) B11 4.65
Pittsburg,Calif.(9) C11..5.35
Pittsburgh(9) J5 .....4.65
Portland,Oreg. O4 .....5.40
Seattle B3, N14 .....5.40
S.Chicago W14 .....4.65
S.Chicago,Ill.(9) R2, U5 4.65
S.Duquesne,Pa.(9) U5...4.65
S.SanFran.,Calif. B3 ...5.40
Sterling,Ill.(1) N15 ....4.65
Sterling,Ill. N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif.(9) C11 ..5.35
Warren,O.(9) R2 .....4.65
Weirton,W.Va.(9) W6 ....4.65
Youngstown(9) R2 U5.4.65

BARS, H.R. Leaded Alloy

Warren,O. C17 .....6.325

BARS, Hot-Rolled Alloy

Bethlehem,Pa. B2 .....5.575
Bridgeport,Conn. N19..5.725
Buffalo R2 .....5.575
Canton,O. R2, T7 .....5.575
Clairton,Pa. U5 .....5.575
Detroit R7 .....5.575
Ecorse,Mich. G5 .....5.675
Fontana,Calif. K1 .....6.625
FairlessHills,Pa. U5 ...5.725
Gary,Ind. U5 .....5.575
Houston S5 .....5.825
Ind.Harbor,Ind. I-2, Y1.5.575
Johnstown,Pa. B2 .....5.575
KansasCity,Mo. S5 .....5.825
Lackawanna,N.Y. B2 ..5.575
LosAngeles B3 .....6.625
Massillon,O. R2 .....5.575
Midland,Pa. C18 .....5.575
S.Chicago R2, U5, W14..5.575
S.Duquesne,Pa. U5 ....5.575
Struthers,O. Y1 .....5.575
Warren,O. C17 .....5.575
Youngstown U5 .....5.575

BARS & SMALL SHAPES, H.R. High-Strength Low-Alloy

Aliquippa,Pa. J5 .....6.80
Bessemer,Ala. T2 .....6.80
Bethlehem,Pa. B2 .....6.80
Clairton,Pa. U5 .....6.80
Cleveland R2 .....6.80
Ecorse,Mich. G5 .....6.90
Fairfield,Ala. T2 .....6.80
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.80
Houston S5 .....7.05
Ind.Harb.,Ind. I-2, Y1..6.80
Johnstown,Pa. B2 .....6.80
KansasCity,Mo. S5 .....7.05
Lackawanna,N.Y. B2 ..6.80
LosAngeles B3 .....7.50
Pittsburgh J5 .....6.80
Seattle B3 .....7.55
S.Chicago W14 .....6.80
S.Duquesne,Pa. U5 ....6.80
S.SanFrancisco B3 .....7.55
Struthers,O. Y1 .....6.80
Warren,O. R2 .....6.80
Youngstown U5 .....6.80

BAR SIZE ANGLES; H.R. Carbon

Bethlehem,Pa. B2 .....4.80

BAR SIZE ANGLES; S. Shapes

Aliquippa,Pa. J5 .....4.65
Atlanta A11 .....4.85
Fontana,Calif. K1 .....5.35
Joliet,Ill. P22 .....5.10
Niles,Calif. P1 .....5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 .....5.40
SanFrancisco S7 .....5.05

BAR SHAPES, Hot-Rolled Alloy

Clairton,Pa. U5 .....5.65
Gary,Ind. U5 .....5.65
Houston S5 .....5.90
KansasCity,Mo. S5 .....5.90
Youngstown U5 .....5.65

BARS, C.F. Leaded Alloy

Ambridge,Pa. W18 ....8.325
Camden,N.J. P13 .....8.35
Chicago W18 .....8.325
Cleveland C20 .....8.325
Monaca,Pa. S17 .....8.325
Newark,N.J. W18 .....8.50
SpringCity,Pa. K3 .....8.30
Warren,O. C17 .....8.325

BARS, Cold-Finished Carbon

Ambridge,Pa. W18 ....6.25*
BeaverFalls,Pa. M12,R2 6.25*
Buffalo B5 .....6.30*
Camden,N.J. P13 .....6.70*
Carnegie,Pa. C12 .....6.25*
Chicago W18 .....6.25*
Cleveland A7, C20 ....6.25*
Detroit R7 .....5.90
Detroit B5 .....6.45*
Detroit P17 .....6.25*
Donora,Pa. A7 .....6.25*
Elyria,O. W8 .....5.90
FranklinPark,Ill. N5 ...6.25*
Gary,Ind. R2 .....6.25*
GreenBay,Wis. F7 .....6.25*
Hammond,Ind. L2, M13..6.25*
Hartford,Conn. R2 ....6.75*
Harvey,Ill. B5 .....6.25*
*LosAngeles(49) S30 ...7.70**
LosAngeles R2 .....7.70*
Mansfield,Mass. B5 ...6.80*
Massillon,O. R2, R8 ...6.25*
Midland,Pa. C18 .....6.25*
Monaca,Pa. S17 .....6.25*
Newark,N.J. W18 .....6.70*
NewCastle,Pa.(17) B4..6.25*
Pittsburgh J5 .....6.25*
Plymouth,Mich. P5 ....6.50*
Putnam,Conn. W18 .....6.80*
Readville,Mass. C14 ...6.80*
S.Chicago,Ill. W14 ....6.25*
SpringCity,Pa. W3 ....6.70*
Struthers,O. Y1 .....6.25*
Waukegan,Ill. A7 .....6.25*
Worcester,Mass. W19 ..6.70*
Youngstown F3, Y1 ...6.25*

*Including 0.35c for special quality.

BARS, Cold-Finished Carbon (Turned and Ground)

Cumberland,Md.(5) C19. 5.16

BARS, Cold-Finished Alloy

Ambridge,Pa. W18 ....7.425
BeaverFalls,Pa.M12,R2 7.425
Bethlehem,Pa. B2 .....7.425
Buffalo B5 .....7.425
Camden,N.J. P13 .....7.60
Canton,O. T7 .....7.425
Carnegie,Pa. C12 .....7.425
Chicago W18 .....7.425
Cleveland A7, C20 .....7.425
Detroit R7 .....7.425
Detroit B5, P17 .....7.625
Donora,Pa. A7 .....7.425
Elyria,O. W8 .....7.425
Gary,Ind. R2 .....7.425
GreenBay,Wis. F7 .....7.425
Hammond Ind. L2, M13.7.425
Hartford,Conn. R2 ....7.725
Harvey,Ill. B5 .....7.425
Lackawanna,N.Y. B2 ..7.425
LosAngeles S30 .....9.10
Mansfield,Mass. B5 ...7.725
Massillon,O. R2, R8 ...7.425
Midland,Pa. C18 .....7.425
Monaca,Pa. S17 .....7.425
Newark,N.J. W18 .....7.60
Plymouth,Mich. P5 ....7.625
S.Chicago W14 .....7.425
SpringCity,Pa. K3 .....7.60
Struthers,O. Y1 .....7.425
Warren,O. C17 .....7.425
Waukegan,Ill. A7 .....7.425
Worcester,Mass. A7 ...7.725
Youngstown F3, Y1 ...7.425

BARS, Reinforcing (To Fabricators)

Ala.City,Ala. R2 .....4.65
Atlanta A11 .....4.85
Birmingham C15 .....5.15
Buffalo R2 .....4.65
Cleveland R2 .....4.65
Ecorse,Mich. G5 .....4.75
Emeryville,Calif. J7 ....5.40
Fairfield,Ala. T2 .....4.65
FairlessHills,Pa. U5 ....4.80
Fontana,Calif. K1 .....5.35
Ft.Worth,Tex.(42) T4 ..5.10
Gary,Ind. U5 .....4.65
Houston S5 .....4.90

Ind.Harbor,Ind. I-2, Y1 4.65
Johnstown,Pa. B2 ....4.65
Joliet,Ill. P22 .....5.15
KansasCity,Mo. S5 ....4.90
Lackawanna,N.Y. B2 ..4.65
LosAngeles B3 .....5.35
Milton,Pa. M18 .....4.80
Minnequa,Colo. C10 ...5.10
Niles,Calif. P1 .....5.35
Pittsburg,Calif. C11 ...5.35
Pittsburgh J5 .....4.65
Portland,Oreg. O4 ....5.40
SandSprings,Okla. S5 ...5.15
Seattle B3, N14 .....5.40
S.Chicago R2 .....4.65
S.Duquesne,Pa. U5 ....4.65
S.SanFrancisco B3 ....5.40
SparrowsPoint,Md. B2 ..4.65
Sterling,Ill.(1) N15 ...4.65
Sterling,Ill N15 .....4.75
Struthers,O. Y1 .....4.65
Torrance,Calif. C11 ...5.35
Youngstown R2, U5, Y1.4.65

BARS, Reinforcing
(Fabricated; to Consumers)

Johnstown,Pa. ¼-1" B2.6.15
KansasCity,Kans. S5 ...6.45
Lackawanna,N.Y. B2 ...6.17
Marion,O. P11 .....6.15
Pittsburgh U8 .....6.17
Seattle B3, N14 .....6.60
SparrowsPt. ½-1" B2...6.15
Williamsport,Pa. S19 ...6.00

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2..4.65
ChicagoHts.(4) C2, I-2..4.65
Ft.Worth,Tex.(26) T4...5.10
Franklin,Pa.(3) F5 ....4.65
Franklin,Pa.(4) F5 ....4.65
JerseyShore,Pa.(4) J8 ..4.65
Marion,O.(3) P11 .....4.65
Moline,Ill.(3) R2 .....4.80
Tonawanda(3) B12 ....4.65
Tonawanda(4) B12 ....5.15
Williamsport,Pa.(3) S19.4.65

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 11.50
Economy,Pa.(D.R.)B14 14.30
Economy(Staybolt)B14. 14.65
McK.Rks. (S.R.) L5 ..11.50
McK.Rks. (D.R.) L5 ..16.00
McK.Rks.(Staybolt) L5.17.00

SHEETS

SHEETS, Hot-Rolled Steel
(18 Gage and Heavier)

Ala.City,Ala. R2 .....4.325
Allenport,Pa. P7 .....4.325
Ashland,Ky.(8) A10 ..4.325
Cleveland J5, R2 .....4.325
Conshohocken,Pa. A3 ..4.375
Detroit(8) M1 .....4.425
Dravosburg,Pa. U5 ....4.325
Ecorse,Mich. G5 .....4.425
Fairfield,Ala. T2 .....4.325
FairlessHills,Pa. U5 ...4.375
Fontana,Calif. K1 ....5.075
Gary,Ind. U5 .....4.325
Geneva,Utah C11 .....4.425
GraniteCity,Ill. G4 ....4.525
Ind.Harbor,Ind. I-2, Y1 4.325
Lackawanna,N.Y. B2 ..4.325
Mansfield,O. E6 (37) ..4.325
Munhall Pa. U5 .....4.325
Newport,Ky.(8) N9 ...4.325
Niles,O. M21 .....4.325
Pittsburg Calif. C11 ...5.025
Pittsburgh J5 .....4.325
Portsmouth,O. P12 ....4.325
Riverdale,Ill. A1 .....4.55
Sharon,Pa. S3 .....4.325
S.Chicago,Ill. W14 ....4.325
SparrowsPoint,Md. B2 .4.325
Steubenville,O. W10 ...4.325
Warren,O. R2 .....4.325
Weirton,W.Va. W6 ....4.325
Youngstown U5, Y1 ...4.325

SHEETS, H.R. (19 Ga. & Lighter)

Ala.City,Ala. R2 .....5.625
Niles,O. M21 .....5.325

SHEETS, H.R. Alloy

Ind.Harbor,Ind. Y1 ....7.20
Youngstown Y1 .....7.20

SHEETS, H.R. (14 Ga. & Heavier)
High-Strength Low-Alloy

Cleveland J5, R2 .....6.375
Conshohocken,Pa. A3 ..6.425
Dravosburg,Pa. U5 ....6.375
Ecorse,Mich. G5 .....6.475
Fairfield,Ala. T2 .....6.375
FairlessHills,Pa. U5 ...6.425
Fontana,Calif. K1 .....7.125
Gary,Ind. U5 .....6.375
Ind.Harbor,Ind. I-2, Y1.6.375
Lackawanna(35) B2 ..6.375
Munhall,Pa. U5 .....6.375
Pittsburgh J5 .....6.375
Sharon,Pa. S3 .....6.375
S.Chicago,Ill. U5 .....6.375
SparrowsPoint(36) B2..6.375
Warren,O. R2 .....6.375
Weirton,W.Va. W6 ....6.375
Youngstown U5, Y1 ...6.375

SHEETS, Hot-Rolled Ingot Iron
(18 Gage and Heavier)

Ashland,Ky.(8) A10 ...4.575
Ind.Harbor,Ind. I-2....4.575

SHEETS, Cold-Rolled Steel
(Commercial Quality)

Allenport,Pa. P7 .....5.325
Cleveland J5, R2 .....5.325
Conshohocken,Pa. A3 ..5.375
Dravosburg,Pa. U5 ....5.325
Detroit M1 .....5.325
Ecorse,Mich. G5 .....5.425
Fairfield,Ala. T2 .....5.325
FairlessHills Pa. U5 ..5.375
Follansbee,W.Va. F4 ..5.325
Fontana,Calif. K1 .....6.425
Gary,Ind. U5 .....5.325
GraniteCity,Ill. G4 ....5.525
Ind.Harbor,Ind. I-2, Y1.5.325
Lackawanna,N.Y. B2 ..5.325
Mansfield,O. E6 .....5.325
Middletown,O. A10 ....5.325
Newport, Ky. N9 .....5.325
Pittsburg,Calif. C11 ...6.275
Pittsburgh J5 .....5.325
Portsmouth,O. P12 ....5.325
SparrowsPoint,Md. B2..5.325
Steubenville,O. W10 ...5.325
Warren,O. R2 .....5.325
Weirton,W.Va. W6 ....5.325
Youngstown Y1 .....5.325

SHEETS, Cold-Rolled
High-Strength Low-Alloy

Cleveland J5, R2 .....7.875
Dravosburg,Pa. U5 ....7.875
Ecorse,Mich. G5 .....7.975
FairlessHills Pa. U5 ...7.925
Fontana,Calif. K1 .....8.975
Gary,Ind. U5 .....7.875
IndianaHarbor,Ind. Y1.7.875
Lackawanna(37) B2 ..7.875
Pittsburgh J5 .....7.875
SparrowsPoint(38) B2..7.875
Warren,O. R2 .....7.875
Weirton,W.Va. W6 ....7.875
Youngstown Y1 .....7.875

SHEETS, Cold-Rolled Ingot Iron

Middletown,O. A10 ....5.825

SHEETS, Culvert (16 Gage)	Cu Alloy	Cu Fe
Ashland,Ky. A10	6.90	...
Canton,O. R2	6.10	6.55
Dravosburg U5	6.10	...
Fairfield T2	6.10	...
Gary,Ind. U5	6.10	6.35
Ind.Harbor I-2	6.10	6.35
Kokomo,Ind. C16	6.20	...
MartinsFry. W10	6.10	...
Newport,Ky. N9	6.10	6.35
Pitts.,Calif. C11	6.85	...
SparrowsPt. B2	6.10	...

SHEETS, Culvert—Pure Iron

Ashland,Ky. A10 .....7.15
Gary,Ind. U5 .....6.35
MartinsFry,O. W10 ....6.35

SHEETS, Galvanized Steel
Hot-Dipped

Ala.City,Ala. R2 .....5.85‡
Ashland,Ky. A10 .....5.85†
Canton,O. R2 .....5.85‡
Dover,O. R1 .....5.85†
Dravosburg,Pa. U5 ...5.85†
Fairfield,Ala. T2 .....5.85†
Gary,Ind. U5 .....5.85*
GraniteCity,Ill. G4 ....6.05
Ind.Harbor,Ind. I-2 ...5.85†
Kokomo,Ind. C16 .....5.95‡
MartinsFerry,O. W10 ..5.85*
Middletown,O. A10 ....5.85†
Newport,Ky. N9 .....5.85‡
Pittsburg,Calif. C11 ...6.60*
SparrowsPt.,Md. B2 ..5.85†
Warren,O. R2 .....5.85†
Weirton,W.Va. W6 ...5.85*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....6.575

SHEETS, Galvanized
High-Strength Low-Alloy

Dravosburg,Pa. U5 ....8.60
SparrowsPoint(39) B2 ..8.60

SHEETS, Galvannealed Steel

Canton,O. R2 .....6.25
Dravosburg,Pa. U5 ....6.25
Kokomo,Ind. C16 .....6.60
Newport,Ky. N9 .....6.25

SHEETS, Galvanized Ingot Iron
(Hot-dipped Continuous)

Ashland,Ky. A10 .....6.10
Middletown,O. A10 ....6.10

SHEETS, Electrogalvanized

Cleveland(28) R2 .....6.70
Niles,O.(28) R2 .....6.70
Weirton,W.Va. W6 ....6.55

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1).8.50
Butler,Pa. A10 (type 2).8.60

SHEETS, Enameling Iron

Ashland,Ky. A10 .....5.90
Cleveland R2 .....5.90
Dravosburg,Pa. U5 ....5.90
Gary,Ind. U5 .....5.90
GraniteCity,Ill. G4 ....6.10
Ind.Harbor,Ind. I-2 ...5.90
Middletown,O. A10 ....5.90
Niles,O. M21 .....5.90
Youngstown Y1 .....5.90

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ...7.75
Ind.Harbor,Ind. I-2 ...7.75
Yorkville,O. W10 .....7.75

SHEETS, Long Terne Steel
(Commercial Quality)

BeechBottom,W.Va. W10 6.25
Gary,Ind. U5 .....6.25
Mansfield,O. E6 .....6.25
Middletown,O. A10 ....6.25
Niles,O. M21 .....6.25
Weirton,W.Va. W6 ....6.25

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....6.65

Key To Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div. Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div., Buffalo-Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Products Dept. Wickwire Spencer Steel Division
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel Div., Sharon Steel Corp.
D4 Disston & Sons, Henry
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft.HowardSteel&Wire
F8 Ft. Wayne Metals Inc.

G2 Globe Iron Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.
H7 Helical Tube Co

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins, E., Steel Tube
I-7 Indiana Steel&Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel&WireCo.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M13 Monarch Steel Div., Jones & Laughlin Steel Corp.
M14 McInnes Steel Co.
M16 Md.Fine&Special. Wire
M17 Metal Forming Corp.
M18 Milton Steel Prod. Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Titanium Corp.

N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New Eng. High Carb. Wire
N8 Newman-Crosby Steel
N9 Newport Steel Corp.
N14 Northwest.SteelRoll.Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.
N19 Northeastern Steel Corp.
O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 PacificStatesSteelCorp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co. Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke&Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Division Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RelianceDiv.,EatonMfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Steel Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service

T2 Tenn. Coal & Iron Div. U. S. Steel Corp.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Strip Division, Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
T13 Tube Methods Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div. U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Division H. K. Porter Co. Inc.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel&Mfg. Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel&Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
W19 Worcester Pressed Steel

Y1 YoungstownSheet&Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.325
Allenport,Pa. P7	4.325
Alton,Ill. L1	4.50
Ashland,Ky.(8) A10	4.325
Atlanta A11	4.525
Bessemer,Ala. T2	4.325
Birmingham C15	4.825
Bridgeport,Conn. N19	4.625
Buffalo(27) R2	4.325
Conshohocken,Pa. A3	4.375
Detroit M1	4.425
Ecorse,Mich. G5	4.425
Fairfield,Ala. T2	4.325
Fontana,Calif. K1	5.075
Gary,Ind. U5	4.325
Ind.Harbor,Ind. I-2, Y1	4.325
Johnstown,Pa.(25) B2	4.325
Lackaw'na,N.Y.(24) B2	4.325
LosAngeles(25) B3	5.075
Milton,Pa. M18	4.325
Minnequa,Colo. C10	5.425
Pittsburg,Calif. C11	5.075
Portsmouth,O. P12	4.325
Riverdale,Ill. A1	4.55
SanFrancisco S7	5.05
Seattle(25) B3	5.325
Seattle N14	5.40
Sharon,Pa. S3	4.325
S.Chicago,Ill. W14	4.325
S.SanFrancisco(25) B3	5.075
SparrowsPoint,Md. B2	4.325
Sterling(1) N15	4.325
Sterling,Ill. N15	4.425
Torrance,Calif. C11	5.075
Warren,O. R2	4.325
Weirton,W.Va. W6	4.325
Youngstown U5	4.325

STRIP, Hot-Rolled Alloy

Bridgeport,Conn. N19	7.50
Carnegie,Pa. S18	7.20
Fontana,Calif. K1	8.85
Gary,Ind. U5	7.20
Ind.Harbor,Ind. Y1	7.20
LosAngeles B3	8.40
Newport,Ky. N9	7.20
Sharon,Pa. S3	7.20
S.Chicago W14	7.20
Youngstown U5, Y1	7.20

STRIP, Hot-Rolled High-Strength Low-Alloy

Bessemer,Ala. T2	6.425
Conshohocken,Pa. A3	6.425
Ecorse,Mich. G5	6.525
Fairfield,Ala. T2	6.425
Fontana,Calif. K1	7.525
Gary,Ind. U5	6.425
Houston S5	6.675
Ind.Harbor,Ind. I-2, Y1	6.425
KansasCity,Mo. S5	6.675
Lackawanna,N.Y. B2	6.425
LosAngeles(25) B3	7.175
Seattle(25) B3	7.425
Sharon,Pa. S3	6.425
S.SanFrancisco(25) B3	7.175
SparrowsPoint,Md. B2	6.425
Warren,O. R2	6.425
Weirton,W.Va. W6	6.425
Youngstown U5, Y1	6.425

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	4.575

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	6.25
Baltimore T6	6.25
Boston T6	6.80
Buffalo S40	6.25
Cleveland A7, J5	6.25
Conshohocken,Pa. A3	6.30
Dearborn,Mich. D3	6.35
Detroit D2, M1, P20	6.35
Dover,O. G6	6.25
Ecorse,Mich. G5	6.35
Follansbee,W.Va. F4	6.25
Fontana,Calif. K1	8.00
FranklinPark,Ill. T6	6.35
Ind.Harbor,Ind. I-2	6.35
Ind.Harbor,Ind. Y1	6.25
Indianapolis C8	6.40
Lackawanna,N.Y. B2	6.25
LosAngeles C1	8.30
NewBedford,Mass. R10	6.70
NewBritain(10) S15	6.25
NewCastle,Pa. B4, E5	6.25
NewHaven,Conn. A7, D2	6.70
NewKensington,Pa. A6	6.25
Pawtucket,R.I. R3	6.90
Pawtucket,R.I. N8	6.80
Pittsburgh J5	6.25
Riverdale,Ill. A1	6.35
Rome,N.Y.(32) R6	6.25
Sharon,Pa. S3	6.25
SparrowsPt.,Md. B2	6.25
Trenton,N.J.(31) R5	7.80
Wallingford,Conn. W2	6.70
Warren,O. R2, T5	6.25
Weirton,W.Va. W6	6.25
Worcester,Mass. A7	6.80
Youngstown C8, Y1	6.25

STRIP, Cold-Rolled Alloy

Boston T6	13.80
Carnegie,Pa. S18	13.45
Cleveland A7	13.45
Dover,O. G6	13.45
FranklinPark,Ill. T6	13.45
Harrison,N.J. C18	13.45
Indianapolis C8	13.60
Pawtucket,R.I. N8	13.80
Sharon,Pa. S3	13.45
Worcester,Mass. A7	13.75
Youngstown C8	13.45

STRIP, Cold-Rolled High-Strength Low-Alloy

Cleveland A7	9.10
Dearborn,Mich. D3	9.20
Dover,O. G6	9.30
Ecorse,Mich. G5	9.20
Ind.Harbor,Ind. Y1	9.30

STRIP, Cold-Finished Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	7.40	9.35	10.90	13.05	15.75
Boston T6	7.65	9.35	10.90	13.05	15.75
Bristol,Conn. W1	...	...	10.80	12.95	15.65
Carnegie,Pa. S18	...	9.05	10.60	12.75	....
Cleveland A7	7.10	9.05	10.60	12.75	15.45
Cleveland C7	...	9.05	10.60	12.75	15.45
Dearborn,Mich. D3	7.20	9.15	10.70	....	....
Detroit D2	7.20	9.15	10.70	12.85	....
Dover,O. G6	7.10	9.05	10.60	12.75	15.45
FranklinPark,Ill. T6	7.20	9.05	10.60	12.75	15.45
Harrison,N.J. C18	...	...	10.80	12.95	15.65
Indianapolis C8	7.25	9.20	10.60	12.75	15.45
NewBritain,Conn.(10) S15	7.10	9.05	10.60	12.75	15.45
NewCastle, Pa. B4, E5	7.10	9.05	10.60	12.75	....
NewHaven,Conn. D2	7.55	9.35	10.90	13.05	....
NewKensington,Pa. A6	7.10	9.05	10.60	....	....
New York W3	...	9.35	10.90	13.05	15.75
Pawtucket,R.I. N8	7.65	9.35	10.90	13.05	15.75
Riverdale,Ill. A1	7.20	9.05	10.60	12.75	15.45
Rome,N.Y.(32) R6	7.10	9.05	10.60	12.75	15.45
Sharon,Pa. S3	7.10	9.05	10.60	12.75	15.45
Trenton,N.J. R5	...	9.35	10.90	13.05	15.75
Wallingford,Conn. W2	7.55	9.35	10.90	13.05	15.75
Warren,O. T5	7.10	9.05	10.60	12.75	15.45
Weirton,W.Va. W6	7.10	9.05	10.60	12.75	15.45
Worcester,Mass. A7, T6	7.65	9.35	10.90	13.05	15.75
Youngstown C8	7.10	9.05	10.60	12.75	15.45
Spring Steel (Tempered)					
Bristol,Conn. W1	...	...	14.40	17.60	....
Buffalo W12	...	...	14.40	....	....
FranklinPark,Ill. T6	...	...	14.90	18.10	21.50
Harrison,N.J. C18	...	...	14.40	17.60	21.00
NewYork W3	...	...	14.40	17.60	21.00
Trenton,N.J. R5	...	...	14.40	17.60	21.00
Worcester,Mass. W12	...	...	14.40	....	....
Worcester,Mass. A7, T6	...	...	14.40	17.60	21.00
Youngstown C8	...	...	15.00	18.35	22.35

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	...	...	9.95	10.95	11.85
Brackenridge,Pa. A4	...	...	9.95	10.95	11.85
Mansfield,O. E6	8.40	9.35	9.95	10.95	11.85
Newport,Ky. N9	8.40	9.35	9.95	10.95	11.85
Niles,O. M21	8.40	9.35	9.95	10.95	...
Vandergrift,Pa. U5	...	9.35	9.95	10.95	11.85
Warren,O. R2	8.40	9.35	9.95	10.95	11.85
Zanesville,O. A10	...	9.35	9.95	10.95	11.85

C.R. COILS & CUT LENGTHS, (22 Ga.)

Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
Brackenridge,Pa. A4	....	....	10.70	11.70	12.60
GraniteCity,Ill. G4	8.80*	9.80*	10.40*	11.40*	....
IndianaHarbor,Ind. I-2	8.60†	9.60*	10.20*	11.20*	....
Vandergrift,Pa. U5	...	10.10†	10.70†	11.70†	12.60†
Vandergrift,Pa. U5	8.60*	9.60*	10.20*	11.20*	12.10*
Warren,O. R2	8.60†	10.10	10.70	11.70	12.60

	Transformer Grade			
H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	12.80	13.35	13.85	14.85
Brackenridge,Pa. A4	12.80	....	....	....
Newport,Ky. N9	12.80	....	....	....
Vandergrift,Pa. U5	12.80	13.35	13.85	14.85
Zanesville,O. A10	12.80‡	13.35‡	13.85‡	14.85‡

	Grain Oriented					
C.R. COILS & CUT LENGTHS (22 Ga.)	T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	....	15.85	17.45	17.95	18.45	13.55**
Butler,Pa. A10	....	....	17.45	17.95	....	....
Vandergrift,Pa. U5	14.85	15.85	17.45	17.95	....	13.55
Warren,O. R2	....	....	....	....	....	13.55‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed. semiprocessed ½c lower. §Coils, ¾-cent higher. **Cut lengths, ¾-cent lower.

Lackawanna,N.Y. B2	9.10
Sharon,Pa. S3	9.10
SparrowsPoint,Md. B2	9.10
Warren,O. R2	9.10
Weirton,W.Va. W6	9.10
Youngstown Y1	9.30

STRIP, Electrogalvanized

Cleveland A7	6.25*
Dover,O. G6	6.25*
Riverdale,Ill. A1	6.35*
Youngstown C8	6.25*
Warren,O. T5	6.25*
Warren,O. B9	6.45*
Weirton,W.Va. W6	5.75*
Worcester,Mass. A7	6.80*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	6.55

TIGHT COOPERAGE HOOP

Atlanta A11	5.05
Riverdale,Ill. A1	4.90
Sharon,Pa. S3	4.75
Youngstown U5	4.75

TIN MILL PRODUCTS

TIN PLATE Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$7.90	$8.15	$8.55
Dravosburg,Pa. U5	7.90	8.15	8.55
Fairfield,Ala. T2	8.00	8.25	8.65
FairlessHills,Pa. U5	8.00	8.25	8.65
Gary,Ind. U5	7.90	8.15	8.55
GraniteCity,Ill. G4	8.00	8.25	8.65
IndianaHarbor,Ind. I-2, Y1	7.90	8.15	8.55
Niles,O. R2	7.90	8.15	8.55
Pittsburg,Calif. C11	8.65	8.90	9.30
SparrowsPoint,Md. B2	8.00	8.25	8.65
Weirton,W.Va. W6	7.90	8.15	8.55
Yorkville,O. W10	7.90	8.15	8.55

ELECTROTIN (22-27 Gage; Dollars per 100 lb)

Aliquippa,Pa. J5	6.675	....	....
Niles,O. R2	6.675	6.875	7.075

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa,Pa. J5	$9.20	$9.45
Dravosburg,Pa.U5	9.20	9.45
Fairfield,Ala. T2	9.30	9.55
Fairless,Pa. U5	9.30	9.55
Gary,Ind. U5	9.20	9.45
Ind.Har. I-2, Y1	9.20	9.45
Pitts.,Calif. C11	9.95	10.20
Sp.Pt.,Md. B2	9.30	9.55
Weirton,W.Va. W6	9.20	9.45
Yorkville,O. W10	9.20	9.45

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$7.00
Dravosburg,Pa. U5	7.00
Fairfield,Ala. T2	7.10
FairlessHills,Pa. U5	7.10
Gary,Ind. U5	7.00
GraniteCity,Ill. G4	7.10
Ind.Harbor,Ind. I-2, Y1	7.00
Niles,O. R2	7.00
Pittsburg,Calif. C11	7.75
SparrowsPoint,Md. B2	7.10
Warren,O. R2	7.00
Weirton,W.Va. W6	7.00
Yorkville,O. W10	7.00

HOLLOWARE ENAMELING Black Plate (29 Gage)

Dravosburg,Pa. U5	6.65
Gary,Ind. U5	6.65
GraniteCity,Ill. G4	6.75
Ind.Harbor,Ind. Y1	6.65
Yorkville,O. W10	6.65

MANUFACTURING TERNES (Special Coated; Base Box)

Dravosburg,Pa. U5	$8.70
Gary,Ind. U5	8.70
Yorkville,O. W10	8.70

MANUFACTURING TERNES (Light Coated, 6 lb; Base Box)

Yorkville,O. W10	$9.15

ROOFING SHORT TERNES (8 lb Coated; Base Box)

Gary,Ind. U5	$10.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	6.60
Aliquippa,Pa. J5	6.60
Alton,Ill. L1	6.775
Atlanta A11	6.80
Bartonville,Ill. K4	6.35
Buffalo W12	6.60
Chicago W13	6.60
Cleveland A7	6.60
Crawfordsville,Ind. M8	6.70
Donora,Pa. A7	6.60
Duluth,Minn. A7	6.60
Fairfield,Ala. T2	6.60
Fostoria,O.(24) S1	6.80
Houston S5	6.85
Jacksonville,Fla. M8	6.95
Johnstown,Pa. B2	6.60
Joliet,Ill. A7	6.60
KansasCity,Mo. S5	6.85
Kokomo,Ind. C16	6.70
LosAngeles B3	7.55
Minnequa,Colo. C10	6.85
Monessen,Pa. P7	6.60
Newark 6-8 ga. I-1	6.90
N.Tonawanda B11	6.60
Palmer,Mass. W12	6.90
Pittsburg,Calif. C11	7.20
Portsmouth,O. P12	6.60
Rankin,Pa. A7	6.60
S.Chicago,Ill. R2	6.60
S.SanFrancisco C10	7.55
SparrowsPoint,Md. B2	6.70
Sterling,Ill.(1) N15	6.60
Sterling,Ill. N15	6.70
Struthers,O. Y1	6.60
Waukegan,Ill. A7	6.60
Worcester,Mass. A7	6.90

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5	7.90
Alton,Ill. L1	8.075
Bartonville,Ill. K4	8.00
Buffalo W12	7.90
Cleveland A7	7.90
Donora,Pa. A7	7.90
Duluth,Minn. A7	7.90
Fostoria,O. S1	7.95
Johnstown,Pa. B2	7.90
LosAngeles B3	8.85
Milbury,Mass.(12) N6	8.20
Minnequa,Colo. C10	8.15
Monessen,Pa. P16	7.90
Muncie,Ind. I-7	8.10
Palmer,Mass. W12	8.20
Pittsburg,Calif. C11	8.85
Portsmouth,O. P12	7.90
Roebling,N.J. R5	8.20
S.Chicago,Ill. R2	7.90
S.SanFrancisco C10	8.85
SparrowsPt.,Md. B2	8.00
Struthers,O. Y1	7.90
Trenton,N.J. A7	8.20
Waukegan,Ill. A7	7.90
Worcester A7,J4,T6,W12	8.20

WIRE, Upholstery Spring

Aliquippa,Pa. J5	7.60
Alton,Ill. L1	7.775
Buffalo W12	7.60
Cleveland A7	7.60
Donora,Pa. A7	7.60
Duluth,Minn. A7	7.60
Johnstown,Pa. B2	7.60
KansasCity,Mo. S5	7.85
LosAngeles B3	8.55
Minnequa,Colo. C10	7.775
Monessen,Pa. P16	7.60
NewHaven,Conn. A7	7.90
Palmer,Mass. W12	7.90
Pittsburg,Calif. C11	8.55
Portsmouth,O. P12	7.60
Roebling,N.J. R5	7.90
S.Chicago,Ill. R2	7.60
S.SanFrancisco C10	8.55
SparrowsPoint,Md. B2	7.70
Struthers,O. Y1	7.60
Trenton,N.J. A7	7.90
Waukegan,Ill. A7	7.60
Worcester,Mass. A7	7.90

WIRE, Fine & Weaving (8" Coils)

Alton,Ill. L1	12.725
Bartonville,Ill. K4	12.65
Buffalo W12	12.55
Chicago W13	12.55
Cleveland A7	12.55
Crawfordsville,Ind. M8	12.65
Fostoria,O. S1	12.55
Jacksonville,Fla. M8	12.90
Johnstown,Pa. B2	12.55
Kokomo,Ind. C16	12.55
Minnequa,Colo. C10	12.30
Monessen,Pa. P6	12.55
Muncie,Ind. I-7	12.75
Palmer,Mass. W12	12.85
Roebling,N.J. R5	12.85
S.SanFrancisco C10	12.90
Waukegan,Ill. A7	12.55
Worcester,Mass. A7,T6	12.85

WIRE, Gal'd ACSR for Cores

Bartonville,Ill. K4	10.70
Buffalo W12	10.70
Johnstown,Pa. B2	10.70
Minnequa,Colo. C10	10.825
Monessen,Pa. P16	10.70
Muncie,Ind. I-7	10.90
Pittsburg,Calif. C11	11.50
Portsmouth,O. P12	10.70
Roebling,N.J. R5	11.00
SparrowsPt.,Md. B2	10.80
Struthers,O. Y1	10.70

ROPE WIRE (A)

Bartonville,Ill. K4	10.55
Buffalo W12	10.55
Fostoria,O. S1	10.55
Johnstown,Pa. B2	10.55
Monessen,Pa. P16	10.55
Muncie,Ind. I-7	10.75
Palmer,Mass. W12	10.85
Portsmouth,O. P12	10.55
Roebling,N.J. R5	10.85
SparrowsPt. B2	10.65
Struthers,O. Y1	10.55
Worcester,Mass. J4	10.85

(A) Plow and Mild Plow; add 0.25c for Improved Plow.

WIRE
(Continued)

WIRE, Tire Bead

Bartonville,Ill. K4	14.15
Monessen,Pa. P16	14.20
Roebling,N.J. R5	14.35

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	9.00
Baltimore T6	9.30
Buffalo W12	9.00
Cleveland A7	9.00
Crawfordsville,Ind. M8	9.00
Dover,O. G6	9.00
Fostoria,O. S1	9.00
FranklinPark,Ill. T6	9.10
Kokomo,Ind. C16	9.00
Massillon,O. R8	9.00
Milwaukee C23	9.20
Monessen,Pa. P16	9.00
Pawtucket,R.I. N8	9.30
Riverdale,Ill. A1	9.10
Rome,N.Y. R6	9.00
Trenton,N.J. R5	9.30
Worcester A7, T6, W12	9.30

NAIL, Stock

To Dealers & Mfrs. (7)	Col.
AlabamaCity,Ala. R2	152
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Chicago,Ill. W13	152
Cleveland A9	157
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Galveston,Tex. D7	157
Houston,Tex. S5	157
Jack'ville,Fla.(23) M8	162
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
KansasCity,Mo. S5	157
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
S.Chicago,Ill. R2	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

NAILS, CUT (100 lb keg)

To Dealers (33)	
Conshohocken,Pa. A3	$9.05
Wheeling,W.Va. W10	9.05

STAPLES, Polished Stock

To Dealers & Mfrs. (7)	Col.
Aliquippa,Pa. J5	152
Atlanta A11	154
Bartonville,Ill. K4	154
Crawfordsville,Ind. M8	154
Donora,Pa. A7	152
Duluth,Minn. A7	152
Fairfield,Ala. T2	152
Jack'ville,Fla.(23) M8	162
Johnstown,Pa. B2	152
Joliet,Ill. A7	152
Kokomo,Ind. C16	154
Minnequa,Colo. C10	157
Monessen,Pa. P7	152
Pittsburg,Calif. C11	171
Rankin,Pa. A7	152
SparrowsPt.,Md. B2	154
Sterling,Ill.(1) N15	152
Worcester,Mass. A7	158

TIE WIRE, Automatic Baler (14½ Ga.) (Per 97 lb Net Box)

Coil No. 3150	
AlabamaCity,Ala. R2	$9.35
Bartonville,Ill. K4	9.45
Buffalo W12	9.35
Crawfordsville,Ind. M8	9.45
Donora,Pa. A7	9.35
Duluth,Minn. A7	9.35
Jacksonville,Fla. M8	9.88
Johnstown,Pa. B2	9.35
Joliet,Ill. A7	9.35
Kokomo,Ind. C16	9.45
LosAngeles B3	10.14
Minnequa,Colo. C10	9.60
Pittsburg,Calif. C11	10.13
S.Chicago,Ill. R2	9.35
SparrowsPt.,Md. B2	9.45
Sterling,Ill. N15	9.35
Coil No. 6500 Stand.	
AlabamaCity,Ala. R2	$9.65
Bartonville,Ill. K4	9.75
Buffalo W12	9.65
Crawfordsville,Ind. M8	9.75
Donora,Pa. A7	9.65
Duluth,Minn. A7	9.65
Jacksonville,Fla. M8	10.18
Johnstown,Pa. B3	9.65
Joliet,Ill. A7	9.65
Kokomo,Ind. C16	9.75
LosAngeles B3	10.45
Minnequa,Colo. C10	9.90
Pittsburg,Calif. C11	10.45
S.Chicago,Ill. R2	9.65
SparrowsPt.,Md. B2	9.75
Sterling,Ill. N15	9.65
Coil No. 6500 Interim	
AlabamaCity,Ala. R2	$9.70
Bartonville,Ill. K4	9.80
Buffalo W12	9.70
Crawfordsville,Ind. M8	9.80
Donora,Pa. A7	9.70
Duluth,Minn. A7	9.70
Jacksonville,Fla. M8	10.23
Johnstown,Pa. B2	9.70
Joliet,Ill. A7	9.70
Kokomo,Ind. C16	9.80
LosAngeles B3	10.50
Minnequa,Colo. C10	9.95
Pittsburg,Calif. C11	10.50
S.Chicago,Ill. R2	9.70
SparrowsPt.,Md. B2	9.80
Sterling,Ill. N15	9.70

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	175**
Aliquippa,Pa. J5	172‡
Atlanta A11	181
Bartonville,Ill. K4	181
Crawfordsville,Ind. M8	181
Donora,Pa. A7	175†
Duluth,Minn. A7	175†
Fairfield,Ala. T2	175†
Houston,Tex. S5	180**
Jacksonville,Fla. M8	186
Johnstown,Pa. B2	179*
Joliet,Ill. A7	175†
KansasCity,Mo. S5	180**
Kokomo,Ind. C16	177†
Minnequa,Colo. C10	180**
Monessen,Pa. P7	178††
Pittsburg,Calif. C11	195†
Rankin,Pa. A7	175†
S.Chicago,Ill. R2	175**
S.SanFrancisco C10	195**
SparrowsPoint,Md. B2	181*
Sterling,Ill.(1) N15	179††

WOVEN Fence, 9-15 ga.

	Col.
Ala.City,Ala. R2	162**
Ala.City, 17 ga. R2	257**
Ala.City, 18 ga. R2	267**
Aliq'ppa,Pa.9-14½ga J5	165‡
Atlanta A11	168
Bartonville,Ill. K4	168
Crawfordsville,Ind. M8	168
Donora,Pa. A7	162†
Duluth,Minn. A7	162†
Fairfield,Ala. T2	162†
Houston,Tex. S5	167**
Jacksonville,Fla. M8	173
Johnstown,Pa.(43) B2	166
Joliet,Ill. A7	162†
KansasCity,Mo. S5	167**
Kokomo,Ind. C16	164†
Minnequa,Colo. C10	167**
Monessen,Pa. 9 ga. P17	166††
Pittsburg,Calif. C11	185†
Rankin,Pa. A7	162†
S.Chicago,Ill. R2	162**
Sterling,Ill.(1) N15	166††

WIRE (16 Gage)

	An'ld Stone	Galv. Stone
Ala.City R2	14.50	16.05**
Bartonville K4	14.60	16.55
Buffalo W12	14.50	....
Cleveland A7	14.50	....
Crawf'dsville M8	14.60	16.55
Fostoria,O. S1	14.60	16.15†
Jacksonville M8	14.85	16.80
Johnstown B2	14.50	16.40*
Kokomo C16	14.60	16.15†
Minnequa C10	14.75	16.45**
Palmer,Mass W12	14.50	16.05*
Pitts.,Calif. C11	14.85	16.40†
S.Chicago R2	14.50	16.05**
SparrowsPt. B2	14.60	16.50*
Sterling(1) N15	14.50	16.45††
Waukegan A7	14.50	16.05†
Worcester A7	14.80	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Ala.City,Ala. R2	7.40	7.80**
Aliquippa J5	7.40	7.925‡
Atlanta A11	7.50	8.10
Bartonville(48) K4	7.50	8.10
Buffalo W12	7.40	8.80†
Cleveland A7	7.40	....
Crawfordsville M8	7.50	8.10
Donora,Pa. A7	7.40	7.80†
Duluth,Minn. A7	7.40	7.80†
Fairfield T2	7.40	7.80†
Houston(48) S5	7.65	8.05**
Jacks'ville,Fla. M8	7.75	8.35
Johnstown B2(48)	7.40	7.975*
Joliet,Ill. A7	7.40	7.80†
Kans.City(48) S5	7.65	8.05**
Kokomo C16	7.50	7.90†
LosAngeles B3	8.35	8.925*
Minnequa C10	7.65	8.05**
Monessen P7(48)	7.40	8.00††
Palmer,Mass. W12	7.70	8.10†
Pitts.,Calif. C11	8.35	8.75†
Portsmouth,O. P12	7.40	....
Rankin A7	7.40	7.80†
S.Chicago R2	7.40	7.80**
S.SanFran. C10	8.35	8.75**
Spar'wsPt.B2(48)	7.50	8.075*
Str'ling(1)(48)N15	7.40	8.00††
Struthers,O.(48)Y1	7.40	7.90‡
Worcester,Mass.A7	7.70	....

*Based on 12.50c zinc; †5c zinc; ‡10c zinc; ‡‡Less than 10c zinc; **Subject to zinc equalization extras. ††13c zinc.

FASTENERS

(Base discounts, full case quantity, per cent off list to consumer, f.o.b. mill)

Carriage, Machine Bolts

Full-Size Body (cut thread)	
†½" x 6" and smaller	61
Larger than ½" diam. and all diams. longer than 6"	55
Under-Size Body (rolled thread; not nutted):	
½" x 6" and smaller.	61

†½" x 4" and smaller and shorter are not nutted.

NUTS

Reg. & Heavy Square Nuts, all sizes	61
H. P. Reg. & Heavy Hex Nuts:	
¾" & smaller	64
⅞" to 1⅛" incl.	63
1¼" to 1½" incl.	65
1⅝" & larger	61
C.P. Reg. & Heavy Hex Nuts	
¾" & smaller	64
⅞" & larger	61
Semifinished & Finished Nuts	
¾" & smaller	66
⅞" & larger	63
Semifinished Slotted Reg. & Heavy Hex Nuts	
¾" & smaller	66
⅞" & larger	63
Hot Galvanized Nuts, all types	
1⅛" & smaller	44

(On above items, add 25% for less than case quantities)

CAP SCREWS
(New Std., hexagon head, upset, packages)

Bright:	
6" and shorter:	
¼" through ½" diam.	34
⅝" & ⅝" diam.	31
¾", ⅞", 1"	8
Longer than 6"	
¼" through ⅝" diam.	3
¾" through 1" diam.	+13
High Carbon, Heat-treated:	
6" and shorter:	
¼" through ½" diam.	20
⅝" & ⅝" diam.	16
¾", ⅞", 1"	+11
Longer than 6"	
¼" through ⅝" diam.	+23
¾" through 1" diam.	+41

(New Std. Hexagon head, upset, bulk)

Bright:	
½" x 6" & smaller & shorter	49
⅝" & ⅝" diam. x 6" & shorter	48
¾", ⅞", 1" x 6" & shorter	31
High Carbon, Heat-treated:	
½" x 6" & smaller & shorter	41
⅝" x ⅝" diam. & 6" & shorter	39
¾", ⅞", 1" x 6" & shorter	20

MACHINE SCREW NUTS & STOVE BOLT NUTS (Bulk)

No. 2 to ⅜" incl., Square:	
25,000 to 199,999 pieces	20
200,000 or more pieces	27
No. 2 to ⅜" incl., Hex.:	
25,000 to 199,999 pieces	18
200,000 or more pieces	25

MACHINE SCREWS, SLOTTED (Bulk)

No. 2 to ¼" diam. incl.:	
25,000 to 199,999 pieces	20
200,000 or more pieces	27
⅝" to ½" diam. incl.:	
15,000 to 99,999 pieces	20
100,000 or more	27

BOILER TUBES

Net base c.l. prices, dollars per 100 ft, mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D.	B.W.	Seamless		Elec. Weld
In.	Gage	H.R.	C.D.	H.R.
1	13	....	21.06	20.42
1¼	13	....	24.94	20.45
1½	13	23.31	27.57	22.61
1⅝	13	27.54	32.57	26.71
2	13	30.87	36.51	29.93
2¼	13	34.77	41.12	33.72
2½	12	37.73	44.63	36.60
2½	12	41.57	49.16	40.31
2¾	12	45.00	53.22	43.65
3	12	47.99	56.76	46.55

RAILWAY MATERIALS

	Standard No. 1	Standard No. 2	Tee Rails All No. 2	Tee Rails 60 lb Under
RAILS				
Bessemer,Pa. U5	4.725	4.625	4.675	5.65
Ensley,Ala. T2	4.725	4.625	....	5.65
Fairfield,Ala. T2	....	....	....	5.65
Gary,Ind. U5	4.725	4.625	4.675	....
Huntington,W.Va. W7	....	....	....	5.65
Indiana Harbor,Ind. I-2	4.725	4.625	4.675	....
Johnstown,Pa. B2	....	....	...(16)	5.65
Lackawanna,N.Y. B2	4.725	4.625	...(16)	5.65
Minnequa,Colo. C10	4.725	4.625	....	6.15
Steelton,Pa. B2	4.725	4.625	....	....
Williamsport,Pa. S19	....	....	....	5.65

TIE PLATES

Fairfield,Ala. T2	5.625
Gary,Ind. U5	5.625
Ind.Harbor,Ind. I-2	5.625
Lackawanna,N.Y. B2	5.625
Minnequa,Colo. C10	5.625
Seattle B3	5.775
Steelton,Pa. B2	5.625
Torrance,Calif. C11	5.775

TRACK BOLTS (20) Treated

Cleveland R2	12.90
KansasCity,Mo. S5	12.90
Lebanon,Pa. B2	12.15*
Minnequa,Colo. C10	12.40
Pittsburgh O3, P14	12.15*
Seattle B3	12.65*

*Untreated

AXLES

Ind.Harbor,Ind. S13	7.25
Johnstown,Pa. B2	7.25

JOINT BARS

Bessemer,Pa. U5	5.825
Fairfield,Ala. T2	5.825
Ind.Harbor,Ind. I-2	5.825
Joliet,Ill. U5	5.825
Lackawanna,N.Y. B2	5.825
Minnequa,Colo. C10	5.825
Steelton,Pa. B2	5.825

SCREW SPIKES

Cleveland R2	11.90
Pittsburgh O3	11.90

STANDARD TRACK SPIKES

Fairfield,Ala. T2	7.90
Ind.Harbor, Ind. I-2, Y1	7.90
KansasCity,Mo. S5	7.90
Lebanon,Pa. B2	7.90
Minnequa,Colo. C10	7.90
Pittsburgh J5	7.90
Seattle B3	8.40
S.Chicago,Ill. R2	7.90
Struthers,O. Y1	7.90
Youngstown R2	7.90

METAL POWDER

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

	Cents
Sponge iron:	
98+% Fe, annealed	9.25
Swedish, c.l.f. Camden, N. J., c.l. in bags	9.50
Domestic, f.o.b., Johnstown, Pa., Riverton, N.J., Niagara Falls, N.Y., in bags	9.50
Canadian, f.o.b. Shipping point	9.50
Electrolytic iron:	
Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	22.00
Annealed, 99.5% Fe	36.50
Unannealed (99+% Fe)	34.00
Unannealed (99+% Fe) (minus 325 mesh)	57.00
Powder Flakes (minus 16, plus 100 mesh)	31.00
Carbonyl Iron:	
97.9-99.8% size 5 to 10 microns	83.00-148.00
Aluminum:	
Atomized, 500 lb. drum frght. allowed	
Carlots	34.50
Ton lots	36.50
Antimony, 500 lb lots	32.00*
Brass, 5000-lb lots	38.25-52.25†
Bronze, 5000-lb lots	63.75-67.00†
Copper:	
Electrolytic	14.25*
Reduced	14.25*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	$1.00
Nickel-Silver, 5000-lb lots	59.75-62.50†
Phosphor-Bronze, ¼-ton lots	58.50
Silicon	47.50
Solder	7.00*
Stainless Steel, 302	99.00
Stainless Steel, 316	$1.32
Tin	14.50*
Zinc 5000-lb lots	19.25-33.00‡
Tungsten	Dollars
Melting grade, 99% 60 to 200 mesh:	
1000 lb and over	4.30
Less than 1000 lb	4.45
Chromium, electrolytic 99.2% Cr min.	3.50

*Plus cost of metal. †Depending on composition. ‡Depending on mesh. §70% Cu, 20% Zn, 10% Ni. **64% Cu, 18% Zn, 18% Ni.

Footnotes

(1) Chicago Base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1¼-in. to less than 1 7/16-in.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass., base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ⅝" and thinner.
(16) 40 lb and under
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(20) 0.25 off for untreated.
(21) New Haven, Conn., base.
(22) Deld. San Francisco Bay area.
(23) Plus 4c per 100 lb.
(24) Deduct 0.10c, finer than 15 Ga.
(25) Bar mill bands.
(26) Delivered in mill zone, 5.25c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill and 0.45c for carbon, add 0.40c for alloy and 0.45c H.S.-L.A.
(31) Widths over ⅝-in.; 6.90c for widths ⅝-in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) 13 Ga. & heavier; 60" & narrower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.25c.
(43) 9-14½ Ga.
(48) 6.7 Ga.
(49) 3½-in. and smaller rounds; 7.95c over 3½-in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Ambridge, Pa. N2	6.5	..	10.5	...	13	...	14.5	...	14.5	...	14	...	16.5	...
Lorain, O. N3	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25
Youngstown Y1	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

ELECTRIC WELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	6.5	+11.5	10.5	+8.25	13	+5.75	14.5	+4.25	14.5	+4.25	14	+4.75	16.5	+2.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Sizes—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Alton, Ill. L1	...	...	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Benwood, W. Va. W10	17.5	+13	9	+18.5	+0.75	+28.5	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Butler, Pa. F6	18	+12.5	9.5	+18	1.5	+26	...	...	...	...	...	...	...	...
Etna, Pa. N2	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Fairless Hills, Pa. N3	...	...	....	....	....	....	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Fontana, Calif. K1	...	...	....	....	....	....	7	+12.25	10	+8.25	12.5	+4.75	15	+3
Ind. Harbor, Ind. Y1	...	...	....	....	....	....	17.5	+1.75	20.5	2.25	23	5.75	25.5	7.5
Lorain, O. N3	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sharon, Pa. S4	18	+12.5	9.5	+18	1.5	+26	...	...	...	...	...	...	...	...
Sharon, Pa. M6	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Sparrows Pt., Md. B2	16	+14.5	7.5	+20	+0.5	+28	16.5	+2.75	19.5	1.25	22	4.75	24.5	6.5
Youngstown R2, Y1	...	...	....	....	....	....	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5
Wheatland, Pa. W9	18	+12.5	9.5	+18	1.5	+26	18.5	+0.75	21.5	3.25	24	6.75	26.5	8.5

Size—Inches	1¼		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	27	9.5	27.5	10	29	10.75	29	10.75	....	...	....	...
Alton, Ill. L1	25	7.5	25.5	8	27	8.75	27	8.75	....	...	....	...
Benwood, W. Va. W10	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Etna, Pa. N2	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Fairless Hills, Pa. N3	25	7.5	25.5	8	27	8.75	27	8.75	17.5	+1.25	17.5	+1.25
Fontana, Calif. K1	15.5	+2	16	+1.5	17.5	+0.75	17.5	+0.75	8	+10.75	8	+10.75
Ind. Harbor, Ind. Y1	26	8.5	26.5	9	28	9.75	28	9.75	18.5	+0.25	18.5	+0.25
Lorain, O. N3	27	9.5	27.5	10	29	10.75	29	10.75	....	...	....	...
Sharon, Pa. M6	27	9.5	27.5	10	29	10.75	29	10.75	....	...	....	...
Sparrows Pt., Md. B2	25	7.5	25.5	8	27	8.75	27	8.75	17.5	+1.25	17.5	+1.25
Youngstown R2, Y1	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75
Wheatland, Pa. W9	27	9.5	27.5	10	29	10.75	29	10.75	19.5	0.75	19.5	0.75

*Galvanized pipe discounts based on current price of zinc (13.50c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	Rerolling: Slabs	Rerolling: Ingot	Forging Billets	Seamless Tube Billets	H.R. Strip	Wire Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	18.50	23.00	....	....	31.00	....	....	....	42.25	39.00
202	19.75	25.50	31.00	36.25	33.50	....	36.75	38.75	42.50	42.50
301	19.25	23.75	....	36.75	32.00	36.00	38.00	....	44.25	41.00
302	20.50	26.25	32.00	37.25	34.50	36.25	38.25	40.25	44.50	44.50
302B	20.25	26.50	33.00	37.25	37.75	36.25	38.25	40.25	47.00	47.00
303	....	26.75	34.75	40.00	....	39.00	41.00	....	....	....
304	21.75	27.50	33.75	39.00	37.25	38.25	40.25	43.00	47.25	47.25
304L	....	....	38.75	44.00	42.25	43.25	45.25	48.00	52.25	52.25
305	23.25	30.25	....	39.50	40.25	38.25	40.25	43.50	50.25	50.25
308	23.50	30.50	38.50	44.25	41.25	43.25	45.50	49.75	52.00	52.00
309	31.00	39.75	46.75	53.50	53.50	52.00	54.75	58.25	67.00	67.00
310	37.25	48.00	62.25	72.25	68.50	69.75	73.50	75.25	78.75	78.75
314	....	....	....	....	....	69.75	....	75.25	....	....
316	31.50	40.25	51.25	59.50	58.25	57.75	60.75	64.00	68.25	68.25
316L	....	....	56.25	64.50	63.25	62.75	65.75	69.00	73.25	73.25
317	37.25	48.25	62.75	72.75	73.50	70.75	74.50	77.00	83.75	83.75
321	25.00	32.00	38.25	44.00	44.25	43.00	45.25	49.25	54.25	54.25
18-8CbTa	29.25	38.00	45.75	52.25	53.25	50.75	53.50	58.00	66.50	66.50
403	....	....	28.75	32.75	....	32.25	34.00	36.25	....	....
405	17.50	23.00	26.75	31.00	32.25	30.50	32.00	33.75	42.25	42.25
410	15.00	19.50	25.50	29.50	28.00	29.00	30.50	31.75	36.25	36.25
416	....	....	26.00	30.00	....	29.50	31.00	....	....	....
420	....	30.25	31.00	36.00	37.75	35.50	37.25	40.75	56.00	56.00
430	15.25	19.75	26.00	30.00	28.75	29.50	31.00	32.25	36.75	36.75
430F	....	....	26.50	30.50	....	30.00	31.50	....	....	....
431	....	25.50	33.25	....	....	37.25	39.25	40.75	....	....
446	....	....	35.50	40.50	53.25	40.00	42.00	43.25	63.25	63.25

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; Alloy Metal Wire Co. Inc.; Alloy Tube Div., Carpenter Steel Co.; American Steel & Wire Div., U. S. Steel Corp.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Charter Wire Products Co.; Cold Metal Products Co.; Crucible Steel Co. of America; Damascus Tube Co.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Ellwood Ivins Steel Tube Works Inc.; Firth Sterling Inc.; Ft. Wayne Metals Inc.; Globe Steel Tubes Co.; Helical Tube Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Joslyn Mfg. & Supply Co.; Kenmore Metals Corp.; Maryland Fine & Specialty Wire Co.; McLouth Steel Corp.; Metal Forming Corp.; McInnes Steel Co.; National-Standard Co.; National Tube Div., U. S. Steel Corp.; Newman-Crosby Steel Co.; Pacific Tube Co.; Page Steel & Tube Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Rodney Metals Inc.; Rome Mfg. Co.; Rotary Electric Steel Co.; Sharon Steel Corp.; Sawhill Tubular Products Inc.; Simonds Saw & Steel Co., Specialty Wire Co. Inc.; Spencer Wire Corp.; Stainless Welded Products Inc.; Standard Tube Co.; Superior Steel Corp.; Superior Tube Co.; Timken Roller Bearing Co.; Trent Tube Co.; Tube Methods Inc.; Ulbrich Stainless Steels; United States Steel Corp.; Universal-Cyclops Steel Co.; Wallingford Steel Co.; Washington Steel Corp.

Clad Steel

	Plates: Carbon Base 10%	Plates: Carbon Base 20%	Sheets: Carbon Base 20%
302	....	....	30.50
304	30.30	36.05	32.50
304-L	32.30	37.95	....
310	41.30	47.00	....
316	35.50	41.40	47.00
316-L	40.00	46.10	....
316-CB	41.15	48.45	....
321	32.00	37.75	37.25
347	34.40	41.40	48.25
405	25.80	33.35	....
410	25.30	32.85	....
430	25.30	32.85	....
Inconel	49.45	65.45	....
Nickel	41.05	55.65	....
Nickel, Low Carbon	43.25	60.05	....
Monel	42.35	56.35	....
Copper*	....	....	46.00

	Strip, Carbon Base, Cold Rolled: 10%	Strip, Carbon Base, Cold Rolled: Both Sides
Copper*	30.00	38.00

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.275	5% Cr Hot Work	0.430-0.460
Extra Carbon	0.330	W-Cr Hot Work	0.450
Special Carbon	0.390	V-Cr Hot Work	0.470
Oil Hardening	0.430	Hi-Carbon-Cr	0.770

Grade by Analysis (%)

W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	...	4.090
18.25	4.25	1	4.75	...	2.305-2.475
18	4	2	9	...	2.675-2.6775
18	4	2	....	...	1.765
18	4	1	....	...	1.600
13.75	3.75	2	5	...	2.245
13.5	4	3	....	...	1.865
9	3.5	..	....	...	1.180
6	4	2	....	5	1.105
6	4	3	....	6	1.350
1.5	4	1	....	8.5	0.960

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, M14, S8, U4, V2 and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax.

Birmingham District	Basic	No. 2 Foundry	Malleable	Bessemer
AlabamaCity,Ala. R2	54.50	55.00‡	....	....
Birmingham R2	54.50	55.00‡	....	....
Birmingham U6	....	55.00‡	59.00	....
Woodward,Ala. W15	54.50	55.00‡	59.00	....
Cincinnati, deld.	....	62.70	....	....
Buffalo District				
Buffalo H1, R2	58.50	59.00	59.50	60.00
Tonawanda,N.Y. W12	58.50	59.00	59.50	60.00
N.Tonawanda,N.Y. T9	....	59.00	59.50	60.00
Boston, deld.	69.15	69.65	70.15	....
Rochester,N.Y. deld.	61.52	62.02	62.52	....
Syracuse,N.Y. deld.	62.62	63.12	63.62	....
Chicago District				
Chicago I-3	58.50	59.00	59.00	59.50
Gary,Ind. U5	58.50	....	59.00	....
S.Chicago R2	58.50	....	59.00	....
S.Chicago,Ill. Y1	58.50	59.00	59.00	59.50
S.Chicago,Ill. U5, W14	58.50	....	59.00	59.50
Milwaukee, deld.	60.67	61.17	61.17	61.67
Muskegon,Mich. deld.	....	65.30	65.30	....
Cleveland District				
Cleveland A7, R2	58.50	59.00	59.00	59.50
Akron,O., deld.	61.25	61.75	61.75	62.25
Lorain,O. N3	58.50	....	....	59.50
Mid-Atlantic District				
Bethlehem,Pa. B2	60.50	61.00	61.50	62.00
NewYork, deld.	....	64.78	65.28	....
Newark, deld.	63.52	64.02	64.52	65.02
Birdsboro,Pa. B10	60.50	61.00	61.50	62.00
Chester,Pa. P14	60.50	61.00	61.50	....
Philadelphia, deld.	62.16	62.66	63.16	....
Steelton,Pa. B2	60.50	61.00	61.50	62.00
Swedeland,Pa. A3	60.50	61.00	61.50	62.00
Philadelphia, deld.	62.16	62.66	63.16	63.66
Troy,N.Y. R2	60.50	61.00	61.50	62.00
Pittsburgh District				
NevilleIsland,Pa. P6	58.50	59.00	59.00	....
Pittsburgh (N&S sides), Aliquippa, deld.	....	60.37	60.37	60.87
McKeesRocks, deld.	....	60.04	60.04	60.54
Lawrenceville,Homestead, Wilmerding, Monaca, deld.	....	60.66	60.66	61.16
Verona,Trafford, deld.	60.69	61.19	61.19	61.69
Brackenridge, deld.	60.95	61.45	61.45	61.95
Bessemer,Pa. U5	58.50	....	59.00	59.50
Clairton,Rankin,S.Duquesne,Pa. U5.	58.50	....	....	....
McKeesport,Pa. N3	58.50	....	....	59.50
Midland,Pa. C18	58.50	....	....	....

Youngstown District	Basic	No. 2 Foundry	Malleable	Bessemer
Hubbard,O. Y1	....	....	59.00	....
Sharpsville,Pa. S6	58.50	....	59.00	59.50
Youngstown Y1	....	....	59.00	59.50
Youngstown U5	58.50	....	....	59.50
Mansfield,O., deld.	63.40	....	63.90	64.40
Duluth I-3	58.50	59.00	59.00	59.50
Erie,Pa. I-3	58.50	59.00	59.00	59.50
Everett,Mass. E1	62.00	62.50	63.00	....
Fontana,Calif. K1	64.50	65.00	....	....
Geneva,Utah C11	58.50	59.00	....	....
GraniteCity,Ill. G4	60.40	60.90	61.40	....
Ironton,Utah C11	58.50	59.00	....	....
LoneStar,Texas L6	....	55.00*	....	....
Minnequa,Colo. C10	60.50	61.00	61.50	....
Rockwood,Tenn. T3	....	55.00‡	59.00	....
Toledo,O. I-3	58.50	59.00	59.00	59.50
Cincinnati, deld.	64.26	64.76	....	....

*Phos. 0.51-0.75%; $56, Phos. 0.31-0.50%.
‡Intermediate (Phos. 0.31-0.69%), $56.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.05% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.25 for each 0.5% Si; 75 cents for each 0.50% Mn over 1%)

Jackson,O. G2, J1	$67.50
Buffalo H1	68.75

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

NiagaraFalls,N.Y. P15	$91.00
Keokuk,Iowa, (Open-hearth & Fdry, freight allowed K2)	95.50
Keokuk, O.H. & Fdry, 12½ lb pigiets, 16% Si, frgt allowed K2	98.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$72.50
Rockwood,Tenn. T3 (Phos. 0.0035% max)	72.50
Steelton,Pa. B2 (Phos. 0.035% max)	66.50
Philadelphia, deld.	70.05
Troy,N.Y. R2 (Phos. 0.035% max)	66.50
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	63.50
Pittsburgh P6 (Intermediate) (Phos. 0.036-0.075% max)	63.50

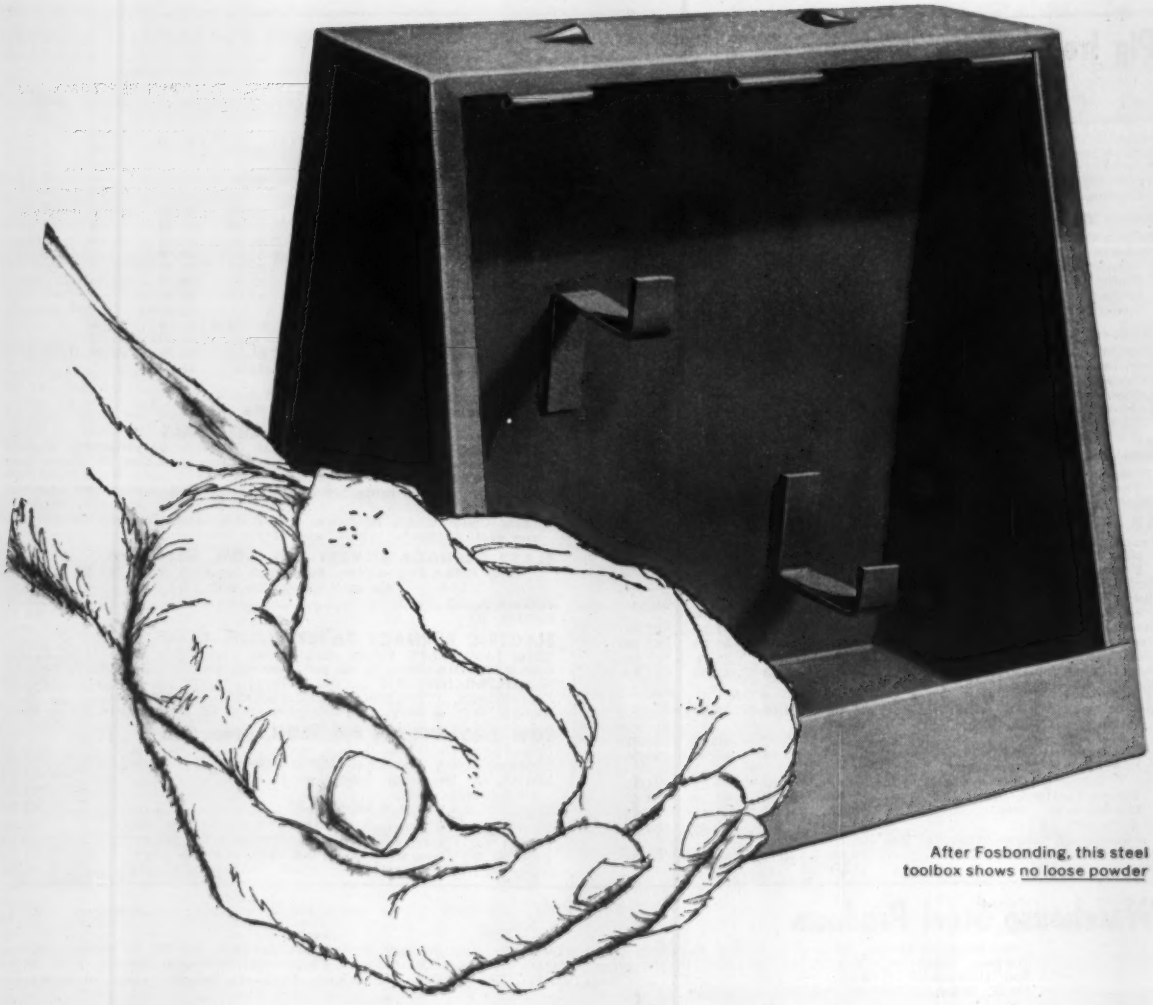
Warehouse Steel Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 25 cents per 100 lb except: Moline, Norfolk, Richmond, Washington, 20 cents; Birmingham, Buffalo, Chicago, Chattanooga, Cincinnati, Cleveland, Detroit, Erie, Jackson, Milwaukee, Pittsburgh, St. Louis, 15 cents; Baltimore, Boston, Los Angeles, Philadelphia, Portland, San Francisco, 10 cents; Atlanta, Houston, Seattle, Spokane, no charge.

	SHEETS				STRIP	BARS				Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Merchant Qual.	H.R. Spec. Qual.	C.F. Rds.‡	H.R. Alloy 4140††[5]		Carbon	Floor
Atlanta	7.14	8.20	8.87	....	7.40	7.42	...	9.39	....	7.63	7.49	9.48
Baltimore	7.08	8.32	8.50	....	7.65	7.66	...	8.62[3]	13.49	7.93	7.21	8.87
Birmingham	6.80	7.90	8.85	....	7.06	7.08	...	9.35	....	7.28	6.99	9.10
Boston	7.75	8.81	10.27	45.57	7.96	7.87	8.40	9.67	13.50	8.13	7.89	9.36
Buffalo	7.05	8.25	10.01	....	7.35	7.35	8.20	7.90	13.35	7.60	7.35	8.90
Chattanooga	6.95	8.10	8.60	....	7.20	7.20	...	9.18	....	7.45	7.25	9.05
Chicago	7.00	8.24	8.65	49.05	7.21	7.27	7.80	7.75	13.05	7.43	7.14	8.61
Cincinnati	7.12	8.23	9.10	46.10	7.45	7.51	8.04	8.15	13.29	7.90	7.43	8.86
Cleveland	7.00	8.24	8.95	49.16	7.31	7.33	7.86	8.00	13.11	7.76	7.31	8.78
Detroit	7.19	8.43	8.93	43.50	7.49	7.55	8.08	8.04	13.25	7.90	7.42	8.80
Erie, Pa.	7.08	8.24	8.95[10]	....	7.31	7.35	...	8.10[10]	....	7.65	7.30	8.79
Houston	7.85	8.75	10.49	....	8.15	8.25	...	9.85	14.00	8.20	7.80	9.20
Jackson, Miss.	7.10	8.20	9.20	....	7.40	7.40	...	9.44	....	7.60	7.45	9.30
Los Angeles	8.05	10.00	11.00	51.50	8.35	8.15	8.70	10.90	14.35	8.30	8.55	10.25
Milwaukee	7.09	8.33	8.74	....	7.30	7.36	7.89	7.94	13.14	7.60	7.23	8.70
Moline, Ill.	7.15	8.44	8.85	....	7.41	7.43	...	8.10	....	7.63	7.34	...
New York	7.61	8.84	9.59	44.95	8.17	8.11	8.66	9.72	13.43	8.09	7.86	9.29
Norfolk, Va.	7.25	...	...	....	7.65	7.65	...	9.50	....	7.95	7.45	8.95
Philadelphia	7.19	8.42	9.37	45.98	7.67	7.68	8.21	8.46	13.21	7.74	7.37	8.69**
Pittsburgh	7.00	8.24	9.40	49.00	7.31	7.27	7.80	8.00	13.05	7.43	7.14	8.61
Portland, Oreg.	7.80	8.80	10.65	....	8.00	7.95	...	12.20	15.00	7.85	7.75	9.60
Richmond, Va.	7.15	...	9.59	....	7.80	7.85	...	9.50	....	8.10	7.35	9.25
St. Louis	7.29	8.53	9.34	43.89	7.50	7.56	8.09	8.29	13.34	7.83	7.43	8.90
St. Paul	7.46	8.59	9.16	....	7.72	7.74	...	8.51	13.51	7.94	7.65	9.12
San Francisco	8.10	9.65	10.15	51.65	8.35	8.10	8.65	11.40	14.30[3]	8.20	8.00	10.20
Seattle	8.55	10.40	10.80	54.00	8.65	8.40	8.95	12.10	14.65	8.30	8.20	10.10
Spokane	8.55	11.00[7]	10.80	....	9.05	8.40	8.95	12.10	15.40	8.30	8.20	10.60
Washington	7.50	8.79	7.97	....	8.12	8.08	...	9.09	....	8.40	7.68	9.34

*Prices do not include gage extras; †prices include gage and coating extras (based on 13.50-cent zinc), except in Birmingham (coating extra excluded); ‡includes 35-cent special bar quality extras; **½-in. and heavier; ††as annealed; §§under ½-in.

Base quantities, 2000 to 4999 lb except as noted; Cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb, and in Los Angeles, 6000 lb and over; stainless sheets, 8000 lb except in Chicago, New York and Boston, 10,000 lb, and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb; [2]—500 to 9999 lb; [3]—400 to 999 lb; [4]—4000 lb and over; [5]—1000 to 1999 lb; [6]—1000 lb and over; [7]—1500 to 3999 lb; [8]—2000 to 3999 lb; [9]—f.o.b. local delivery in lots of 10,000 lb and over; [10]—2000 lb and over.



After Fosbonding, this steel toolbox shows no loose powder

Get powder-free iron phosphate coatings under organic finishes with FOSBOND 22

Here's a truly dependable iron phosphate coating! Fosbond® 22 assures uniform, trouble-free phosphate protection of metal parts, cuts your finishing rejects to the bone. The balanced composition of Fosbond 22 prevents the highs and lows of ordinary phosphate films, and its superior cleaning power lets you clean and coat in one spray bath.

Shipped as a dry powder in a non-returnable drum, Fosbond 22 simplifies your storage and processing all down the line. In addition, long, economical bath life and improved corrosion-resistance under organic finishes help Fosbond 22 pay for itself in re-charge savings and lowered reject rate.

TRY IT IN YOUR CYCLE. See how this inexpensive, easily-controlled phosphate system cuts cleaning and coating costs. Where iron phosphate coating is indicated, you just can't match the simple Fosbond 22 process. Ask your Pennsalt representative for a demonstration in your equipment, or write Metal Processing Dept. 263, Pennsylvania Salt Manufacturing Company, Three Penn Center Plaza, Philadelphia 2, Pa. In Canada: Pennsalt Chemicals of Canada, Hamilton, Ontario.

Pennsalt Chemicals

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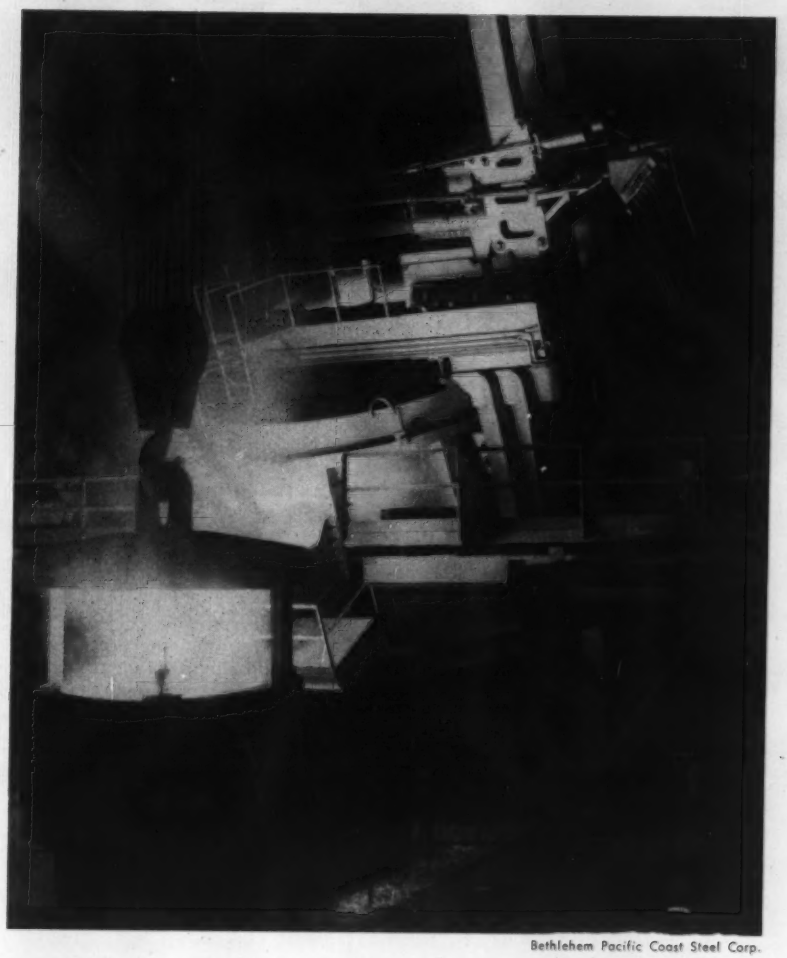
A BETTER START FOR YOUR FINISH



Bethlehem Pacific Coast Steel Corp.

The furnaces will keep busy because producers see . . .

Good Year for Alloy Steel

ALLOY STEEL producers are looking forward to another year of near-capacity operations despite a critical shortage of nickel and an uncertain automotive market.

Bouncing back from one of the worst slumps in recent years, producers made over 1 million tons more alloy steel (including silicon steel) in the first 11 months of 1955 than they did in all of 1954, according to the American Iron & Steel Institute. They produced 551,359 tons more hot-rolled bars through November, 1955, than in 1954. This year may well end up on a par with last.

Pinch—But the cry throughout the industry is: "Give us more nickel!" This critical shortage even overshadows the slump in the automotive market, the biggest user of alloy steel. "For a while it was just a matter of limiting the size of orders for nickel alloys," says one sales official. "But lately, we have had to refuse some orders—even from long-established customers."

Alloy producers are afraid of the long-term consequences of the shortage. Designers are trying to get away from dependence on nickel, often turning to other alloys. But many times they turn to high-grade, high-strength carbon steel. One salesman tells of a customer who formerly used a 4300 steel on six parts of an assembly. Now he uses it on only two parts.

Problem No. 2—Automotive cutbacks aren't causing as much of a furor as might be expected. Ordering by automakers is more important to alloy producers than to carbon steel producers—it takes a greater proportion of their output. But one producer says the slackening "has been more of a relief than anything else for us." Besides, the full impact of the cutbacks is not yet known to alloy men. There is usually a lag of two or three weeks between Detroit scheduling and alloy steel mill order books. Some loosening in delivery times—from 10 to 12 weeks, down to eight to ten weeks—may show up on February orders, but the industry isn't planning any production slowdowns. There have been some cancellations (mostly of bonus tonnages), but other customers have snapped up the "excess."

Among the users expected to fill the gap are the manufacturers of trucks, heavy roadbuilding equipment, machine tools, oil country goods, fasteners and aircraft. Some alloy producers are hoping for a better market from farm machinery makers this year. Defense uses should be up, partly because of the speed-up in the military aircraft and guided missile programs. Even users of such small tonnage items as hot-rolled products will help take any slack left by auto producers.

However, if the auto people decide to take advantage of this lull in production to build up their inventories, it is doubtful that the steel mills will notice any slackening. A lot depends on when new models are slated to come out. If late fall showings are set, inventory building is a possibilty. If automakers decide to unveil their wares early in the second half to bolster faltering sales, it is unlikely they will continue to build stocks at this time.

Psychology—"We aren't underestimating the effects of the automotive situation," says Walter H. Blocher, assistant manager of sales for Republic Steel Corp.'s Alloy Steel Division. "You certainly can't ignore the psychological effect it may have on business in general. But if these other markets show anywhere near the strength we hope for, the first six months should be good. As far as we can see now, prospects for the last six months are pretty good, too."

This year is starting out to make that prediction come true, at any rate. Bars, especially the smaller sizes, are in tight supply and are likely to remain that way for some time. Heavier bars are easier to get because in a peacetime economy there aren't as many uses for them as there are in wartime emergencies. The net result is that in some mills the furnaces have not been going at full tilt. The finishing capacity for small bars can't keep up with them.

Prices Up—Users can expect to

pay more this year for alloy steel as well as carbon steel products. The trend upward so far has been caused by higher extras. In December, the increase amounted to between $1 and $7 a ton, depending on the product. Higher prices for scrap and ferroalloys have caused the upswing. Base prices have been unaffected, but they will go up later in the year.

Cold finishers of alloy bars report high-level sales heading into 1956. They have not been hit hard by automotive cancellations. For this segment of the industry, it will be a month or two before Detroit cutbacks make much impression on the order books. One large producer says it has had some minor cancellations, but they were taken immediately by other customers.

So with many of the order books open and filling for second quarter, alloy steel producers are enjoying their "rest" and hoping for enough nickel to fill the orders.

STEEL MILL ROLLS
by
TITUSVILLE FORGE

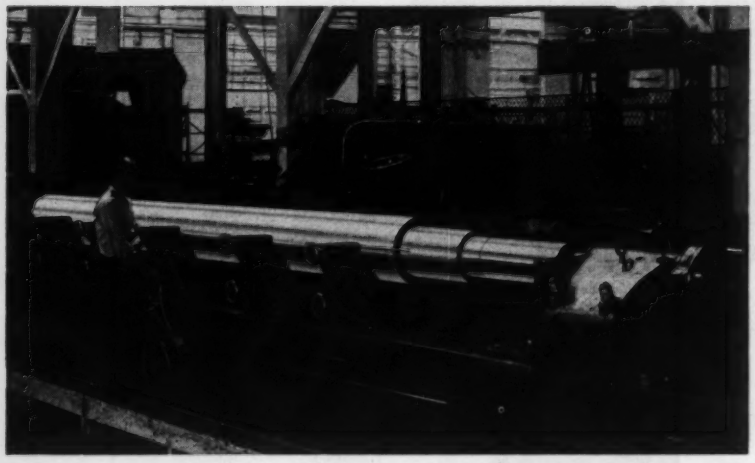


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Plate rolls—bending rolls—back up rolls—straightening rolls—table rollers and other mill rolls are dependably forged and ground in any size—to any specification at Titusville Forge. Illustrated above is a straightening roll being ground on our 42" Landis Grinder. Size is 16" diameter x 28'3⅛" long, 40/45 scleriscope hardness.

Rely on Titusville Forge for rolls that meet your specific requirements.

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TITUSVILLE, PA.
PLANTS AT TITUSVILLE, PA., and WARREN, PA.
Offices in Principal Cities

Stainless Steel . . .

Stainless Steel Prices, Page 172

The automotive industry in 1955 received an estimated 140,000 tons of stainless steel, accounting for more than 20 per cent of total stainless shipments, reports the American Iron & Steel Institute. About 98 per cent of the auto total was in sheet and strip, largely used for passenger car trim.

The functional value of stainless is as much responsible for its use as its beauty. Automotive engineers cite the corrosion resistance of stainless hub caps and stone shields where cars travel on streets spread with salt. Other major uses of stainless in passenger cars include window trim and hardware, lamp housing assemblies, interior trim and radiator grilles.

Wire . . .

Wire Prices, Pages 170 & 171

Second quarter wire bookings are not so brisk as they were, and more consumers tend to lag behind on the 45-day lead time unless they are pressured into action. Exceptions are in heavy highway and building accessories, including mat reinforcing. Mill backlogs are large and buying is strong.

Rope wire is in more active demand, notably two and three-wire, high-carbon strand and twisted flat wire for stone sawing.

Midwestern wire makers are receiving no cancellations or shipment holdbacks from the automobile builders despite the latter's reduction in assemblies.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 169 & 170

Greater optimism over second and third quarter sheet steel volume is following publication of encouraging comments of industry executives, reported in STEEL a week ago. The automakers are not trimming their orders as much as they are cutting back production. They must build up depleted inventories.

Some sheetmakers are moving slowly in opening second quarter order books, but most of them have taken action.

The mills anticipate no difficulty taking up any slack in demand resulting from the auto curtailments. Other consumers need sheets for current manufacturing schedules. All of them must replenish inventories.

While the pressure is somewhat easier on hot and cold-rolled sheets, demand still runs in excess of supply. This is not the case with galvanized sheets, however, which ap-

an important weapon in America's arsenal

THE WORLD'S LARGEST STEAM DROP HAMMER

Under a contract with the United States Government, Erie Foundry Company has recently delivered the eighth 50,000 lb. Steam Drop Hammer, the largest ever built.

Here are some of this all-steel hammer's dimensions:

Weight: 1,650,000 lbs.
Height, overall: 45 ft.
Height, floor line to top: 28½ ft.

The hammer was completely machined and assembled for factory pre-testing (a standard Erie Foundry Company procedure on all machines) in Erie Foundry's plant—a modern factory which is equipped with new giant machine tools to handle such large work.

Of special interest to hammermen is the 25 to 1 anvil ratio. The added anvil weight more fully utilizes this hammer's tremendous impact energy of 850,000 foot pounds. Like all Erie hammers, all stressed parts on the 50,000 lb. machine are *steel*.

With eight 50,000 lb. Erie Steam Drop Hammers in service and stand-by, our country is ready to forge the larger component forgings needed in the weapons of today and tomorrow.

the greatest name in forging hammers

ERIE

in our 61st year

WRITE FOR BULLETIN 355

ERIE FOUNDRY CO. ERIE, PA.

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KRANE KAR

"HAS GIVEN US EXCELLENT SERVICE AT LOW MAINTENANCE COST," says
ATLAS FORGINGS COMPANY
CICERO, ILL.

"KRANE KAR Unloads freight cars of billets weighing up to 6000 lbs.... Stacks them in yard... Transports billets to saw shop... Loads forgings on trucks for shipment. KRANE KAR is easier to use than our old stationary crane, and saves us time. Now we can make full use of our yard for billet inventory." Ask for Bulletin #79.

Ask about our Lease-a-KRANE KAR-Plan ... 1 to 3 Year Lease with Option to Purchase

Another SILENT HOIST "First" —FLUID DRIVE!

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Pioneer Mfrs. of Heavy Duty Materials-Handling Equipment
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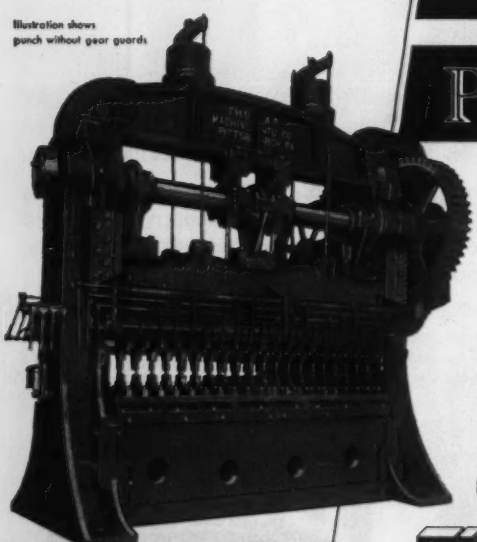
the trend is to THOMAS

Multiple Punches

Illustration shows punch without gear guards



● This 1000 ton capacity Multiple Punch was recently shipped by Thomas to a leading railroad car shop, and installed with a Thomas Automatic Spacing Table. ● This combination handles complete punching of four center sill Z sections, two beams or channels four angles or plates up to 12 ft. wide... all automatically without layout on the work.

Other multiples available in various widths and tonnages, with or without Spacing Tables.

THOMAS
MACHINE MANUFACTURING CO.
PITTSBURGH 23, PA.

53 Write for Bulletin 306

Shears • Presses • Spacing Tables • Benders

pear to be in supply-demand balance. High silicon sheets are in easier supply.

Producers of hot-rolled sheets and strip are revising extras in line with changes effected Jan. 26 by U. S. Steel Corp. The revisions result in an increase of about 3 per cent.

Imported Steel Prices Rise

Prices on imported steel from western continental Europe are strong and are moving higher on some products.

I-beams and wide flange beams are up 20 cents per 100 lb. Barbed wire is quoted 5 cents higher, while merchant bars and hot-rolled bands are up 30 cents. Prices on the latter two products are nominal. There has been no recent advance on plates, but the prevailing quotation on that item also is nominal.

Demand is less active, due, in part, to premiums asked above domestic prices. Extended deliveries, especially on the major tonnage items, also are a factor. Shipment promises on plates and oil country pipe run July-August. Deliveries on wide flange beams range May-June and on merchant bars April-May. Only limited tonnage is available for these deliveries. Hot-rolled sheets can be had for late March and April shipment, but prices are too high to attract much business.

Ferroalloy Prices

FERROALLOY quotations remain unchanged. The current price schedule was published in full on page 141 of the Jan. 30 issue of STEEL.

Steel Bars . . .

Bar Prices, Page 168

Although demand continues strong for all sizes of hot-rolled carbon bars, especially the hot-top grade in large rounds (3 in. and over), squares and heavy flats, some minor order cancellations and delivery deferments on automotive account are noted.

These include hot-rolled and cold-finished, but in view of the over-all tight supply situation, the mills do not regard the defections as significant or as setting a trend.

Most hot bar producers have opened books for second quarter on a month-to-month basis. Customers are promised about the same tonnage as they will receive in the current quarter.

Cold-drawn bars are being booked

as far ahead as possible. The same is true of alloy bars, with mill backlogs not too extended. Stainless bars are in easy supply, four to six weeks delivery in some cases. Pick-up in cold-finished business is expected.

In New England, the automotive cutbacks are being reflected in slackened demand from the forge shops.

Plates . . .

Plate Prices, Page 168

The plate mills, generally, are following the lead of U. S. Steel in revising extras on hot-rolled carbon plates. The over-all adjustments amount to an increase of about 5 per cent. Base prices are unchanged.

Revisions were made in extras for thickness, width, specification and chemical requirements, quality, heat treatment, surface finish and gas cutting. The base size was changed to ½-in. to 1 in. in thickness, over 80 to 90 in. in width. It formerly was ½-in. to 1.5-in. in thickness, over 60 to 90 in. in width.

Pressure for plates is as strong as ever. Added to the heavy requirements for line pipe, tanks, the oil and chemical industries, heavy equipment, building, railroad cars, etc., the needs on shipbuilding account are beginning to broaden. Shipbuilders will place more tonnage in second quarter.

Shipwork is featured by the placing of $166,480,000 of Navy contracts, comprising seven destroyers and three frigates. The latter will be built at the Quincy yard of the Bethlehem Steel Co. Three of the destroyers will be built by the Bath Iron Works, Bath, Me., two by the Ingalls Shipbuilding Co., Pascagoula, Miss., and two by the Puget Sound Bridge & Dredging Co., Seattle.

Structural Shapes . . .

Structural Shape Prices, Page 168

Structural steel demand is quickening. Further gains are expected as spring approaches. Fabricating shops are making little headway in reducing order backlogs. Some are losing ground. A few of the larger fabricators are booked ahead 12 and 14 months, while some medium shops have backlogs which extend eight and nine months.

The stringency in wide flange sections and the larger sizes of standard shapes continues.

Little easing in supply is expected before summer.

The St. Lawrence power project will take close to 30,000 tons of steel in 1956, largely structurals. Over-all, this undertaking will require an estimated 100,000 tons. Contracts

by FAIRFIELD

GEAR PERFORMANCE to match the ever-increasing power and speed of modern machines is Fairfield's specialty. This is possible because Fairfield has constantly held a position of leadership in utilizing the most advanced methods, machines, and techniques for producing better gears. By keeping apace with modern engineering trends, Fairfield renders an invaluable service to many of the nation's leading machinery builders: *"Gear Performance Made to Order!"*

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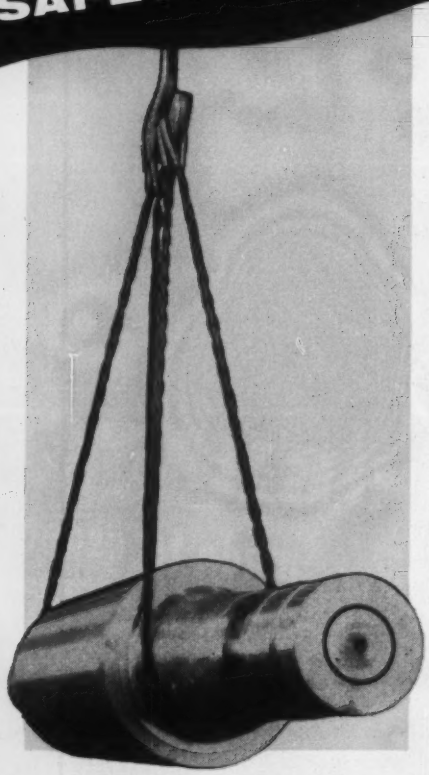

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By Albert Portevin

Fundamental knowledge and essential principles of heat treatment of steel are presented in simple and understandable manner. Research engineers, metallurgical students and steel plant metallurgists engaged in metallurgical investigations and the heat treatment of ferrous and non-ferrous metals will find this book of inestimable value.

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69 illustrations — Price $5.00 Postpaid

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Book Department, 1213 W. 3rd St., Cleveland 13, O.

placed to date involve 31,000 tons.

Bridge inquiry in New England is at peak, led by 30,545 tons (closing Feb. 14 and 20 at Hartford, Conn.) for the Connecticut turnpike.

Tubular Goods . . .

Tubular Goods Prices, Page 172

Except for buttweld, pipe deliveries are more extended. This is notably true of seamless tubes. There will be some first quarter carry-overs in seamless. Producers are 60 days behind on shipments of 12-in. and larger tubes.

January order volume in buttweld in the New England area was double that of the preceding month. Utilities in the district are buying larger tonnage. The bulk, seamless tubes, will be shipped in the second quarter.

Mechanical and pressure tubing orders are improved. Most mills will open their books for second quarter business around Feb. 15.

The outlook for business in oil country goods is exceptionally promising. Estimates of oil well drilling in 1956 are about 2 to 5 per cent above the number of wells drilled in 1955.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

2700 tons, power plant, Baltimore Gas & Electric Co., Baltimore, to Belmont Iron Works, Eddystone, Pa.

2600 tons, power plant, Virginia Electric & Power Co., Bremo, Va., to American Bridge Division, U. S. Steel Corp., Pittsburgh, through Stone & Webster Engineering Corp., Boston, contractor-engineer.

1945 tons, nine grade separation structures and highway section, Connecticut turnpike, Stamford-Darien, Conn., Project 305-01, to the Pusey & Jones Corp., Wilmington, Del.; Peter W. Kero Inc., Carlstadt, N. J., general contractor.

1300 tons manufacturing building, Kearfott Co. Inc., Little Falls, N. J., to Schacht Steel Construction Inc., New York.

800 tons, paper plant, Downingtown, Pa., to Belmont Iron Works, Eddystone, Pa.

760 tons, tube bending mill, Riley Stoker Corp., Cornwell Heights, Pa., to Frank M. Weaver Co., Lansdale, Pa.; Ballinger Co., Philadelphia, is construction engineer.

375 tons, six bridge structures, Fall River-Boston expressway, Fall River, Mass., to Builders Iron Works, Somerville, Mass.; A. V. Taurasi Co. Inc., Somerville, general contractor.

330 tons, section of Vine street, a state project, Philadelphia, through Lipsett Co., New York, to Phoenix Bridge Co., Phoenixville, Pa.

250 tons, classroom building, Molloy College, Queens, New York, to Schacht Steel Construction Inc., New York.

235 tons, addition, Southwark station, Philadelphia Electric Co., Philadelphia, to Belmont Iron Works, Eddystone, Pa.

170 tons, office building, Merchants Co-Operative Bank, Tremont street, Boston, to Groisser & Shlager Iron Works, Somerville, Mass.; J. J. Powers Co., Cambridge, Mass., general contractor.

160 tons, two floating pile drivers for the Navy, to the Todd Shipyard Corp.'s Seattle Division.

STRUCTURAL STEEL PENDING

11,700 tons, including 700 tons of high tensile low alloy, bridge superstructure, Connecticut turnpike, Bridgeport, Conn., Project 310-02; bids Feb. 20, Hartford, Conn.; also 1200 tons of concrete reinforcing bars.

11,000 tons, including 3000 tons of high tensile

Ores

Lake Superior Iron Ore

(Prices effective for the 1956 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports)

Old range bessemer	$11.25
Old range nonbessemer	11.10
Mesabi bessemer	11.10
Mesabi nonbessemer	10.95
Open-hearth lump	12.10

Eastern Local Iron Ore

Cents per unit, deld. E. Pa.

Foundry and basic 52-62% concentrates contract	17.00-18.00

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60-68%	20.00
N. African hematite (spot)	nom. 18.00-20.00
Brazilian iron ore, 68-69% (spot)	26.00-28.00

Tungsten Ore

Net ton unit, before duty

Foreign, wolframite, good commercial quality	$33.75-$34.25
Domestic, scheelite, mine	63.00

Manganese Ore

Mn 48%, nearby, $1.06-$1.11 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; 46-47%, 95c-$1.00.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and African

48% 2.8:1	nom. $45.00-$50.00
48% 3:1	42.00-44.00
48% no ratio	34.00

South African Transvaal

44% no ratio	$19.00-$20.00
48% no ratio	33.00-35.00

Domestic

Rail nearest seller

18% 3:1	$39.00

Molybdenum

Sulphide concentrate, per lb of Mo content, mines, unpacked $1.00

Antimony Ore

Per unit of Sb content, c.i.f. seaboard

55-60%	$3.60-$3.85
60-65%	3.85-4.00

Vanadium Ore

Cents per lb V_2O_5 content, deld. mills

Domestic	31.00

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parral, Portsmouth, O., Ottawa, Ill., Stevens Pottery, Ga., $122; Salina, Pa., $127; Niles, O., $133.

Super-Duty: Ironton, O., St. Louis, $150.

Silica Brick (per 1000))

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Portsmouth, O., Hawstone, Pa., $128; Warren, Niles, O., Hays, Pa., $133; Morrisville, Pa., $131.50; E. Chicago, Ind., Joliet, Rockdale, Ill., $138; Lehigh, Utah, $144; Los Angeles, $151.

Super Duty: Hays, Sproul, Hawstone, Pa., Warren, Windham, O., Athens, Tex., $145; Morrisville, Pa., Niles, O., $148; Joliet, Ill., $151; Curtner, Calif., $163.

Semisilica Brick (per 1000)

Clearfield, Pa., $139; Philadelphia, $124; Woodbridge, N. J., $122.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Pa., Mexico, Vandalia, Mo., $88.50; Wellsville, O., $92.50; Clearfield, Pa., Portsmouth, O., $98.

High-Alumina Brick (per 1000)

50 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $194; Danville, Ill., $197; Philadelphia, Clearfield, Pa., $201.

60 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $241; Danville, Ill., $244; Philadelphia, Clearfield, Pa., $248.

70 *Per Cent:* St. Louis, Mexico, Vandalia, Mo., $279; Danville, Ill., $281; Clearfield, Pa., Philadelphia, $286.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $157; Clearfield, Pa., $158.50; St. Louis, $169.30.

Nozzles (per 1000)

Reesdale, Pa., $253.70; Johnstown, Pa., $259.20; Clearfield, Pa., $259.40; St. Louis, $259.45; Bridgeburg, Pa., $258.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $196; Clearfield, Pa., $198; St. Louis, $195.80.

Dolomite (per net ton)

Domestic, dead-burned bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, O., Gibsonburg, Narlo, O., $15; Thornton, McCook, Ill., $15.60; Dolly Siding Bonne Terre, Mo., $14.

Magnesite (per net ton)

Domestic, dead-burned, bulk, ¼-in. grains with fines: Chewelah, Wash., $40; Luning, Nev., $40. ⅝-in. grains with fines: Baltimore, $66.40.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, furnace	$13.75-14.50
Connellsville, foundry	16.00-17.00

Oven Foundry Coke

Birmingham, ovens	$25.65
Cincinnati, deld.	30.58
Buffalo, ovens	27.50
Buffalo, deld.	28.75
Camden, N. J., ovens	26.50
Chicago, ovens	27.00
Cincinnati, deld.	28.50
Detroit, ovens	27.50
Detroit, deld.	28.50
Pontiac, deld.	29.06
Saginaw, deld.	30.58
Erie, Pa., ovens	27.50
Everett, Mass., ovens New England, deld.	*28.55
Indianapolis, ovens	26.75
Kearny, N. J., ovens	26.75
Lone Star, Tex., ovens	19.50
Milwaukee, ovens	27.50
Neville Island, (Pittsburgh) Pa., ovens	26.25
Painesville, O., ovens	27.50
Cleveland, deld.	29.43
Philadelphia, ovens	26.50
Portsmouth, O., ovens	24.75
Cincinnati, deld.	27.34
St. Paul, ovens	26.50
Swedeland, Pa., ovens	26.50
Terre Haute, Ind., ovens	26.75

*Or within $4.55 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg.	32.00-34.00
Industrial xylene	32.00-35.00

Per ton, bulk, ovens

Ammonium sulphate	$42-$45
Birmingham area	42.00†

†With port equalization against imports.

Cents per pound, producing point

Phenol: Grade 1, 15.00; Grade 2-3, 14.50; Grade 4, 16.50; Grade 5, 15.25.

Fluorspar

Metallurgical grades, f.o.b. shipping point, in Ill., Ky., net tons, carloads; effective CaF_2 content 72.5%, $38-$39; 70%, $35-$36; 60%, $31-$32. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $34; Mexican, $26.50.

Electrodes

Threaded with nipple, unboxed, f.o.b. plant

GRAPHITE

Diam (Inches)	Length	Per 100 lb
2	24	$52.50
2½	30	33.75
3	40	32.00
4	40	30.25
5½	40	30.00
6	60	27.25
7	60	26.75
8, 9, 10	60	24.25
12	72	27.25
14	60	23.50
16	72	22.50
17	60	23.00
18	72	22.50
20	72	22.25

CARBON

8	60	12.10
10	60	11.80
12	60	11.75
14	60	11.70
14	72	10.85
17	60	10.75
17	72	10.35
20	84	10.30
20	90	10.10
24	72, 84	10.30
24	96	10.05
30	84	10.20
40, 35	110	9.90
40	100	9.90

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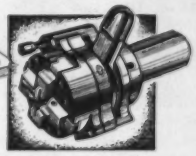

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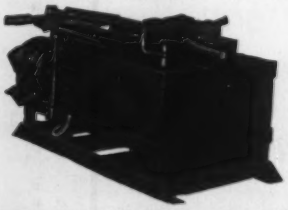

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low alloy, bridge superstructure, Connecticut turnpike, New Haven, Conn., Project 317-05; bids Feb. 20, Hartford, Conn.; also 1200 tons of concrete reinforcing bars.

6000 tons, Jewish Medical Center, Baltimore; bids Feb. 14.

5000 tons, including 3400 tons of high tensile low alloy, bridge superstructure, Connecticut turnpike, Bridgeport, Conn., Project 312-02; bids Feb. 20, Hartford, Conn.; also 800 tons of concrete reinforcing bars.

3620 tons, state bridge work, Beaver county, Pa., Pittsburgh Des Moines Steel Co., low bidder.

3364 tons, state thruway bridges, Erie county, New York; bids Feb. 2.

2445 tons, state bridge work, Philadelphia; Lipsett Co. and Booth & Flynn, New York, low on general contract with a joint bid.

2400 tons, state thruway bridge work, Westchester county, New York; bids Feb. 2.

1890 tons, state thruway bridge work, Erie county, New York; bids Feb. 2.

1600 tons, state highway bridges, Connecticut turnpike, Fairfield, Conn., Project 310-01; bids Feb. 14, Hartford, Conn.; also 1200 tons, concrete reinforcing bars, and 70 tons, steel piles.

1245 tons, state highway bridges, Connecticut turnpike, Greenwich, Conn., Project 302-02; bids Feb. 14, Hartford, Conn.; also 1000 tons, concrete reinforcing bars and 1100 tons, steel piles.

1116 tons, Air Force Academy; bids to Maj. T. E. Correll, contracting officer, Colorado Springs, Colo., Mar. 27; bids call Feb. 24.

750 tons, Oregon Trunk Railway, Oregon; American Bridge Division, U. S. Steel Corp., Portland, Oreg., reported low.

500 tons, 685-ft Oregon state Snake river bridge; bids opened Jan. 26.

400 tons, Marple-Newton joint senior high school, Marple, Pa.; bids Feb. 9.

350 tons, state highway bridge, Southeast expressway, Braintree-Quincy, Mass.

276 tons, state bridge, route 17, section 9-E, Bergen county, New Jersey; bids Feb. 14; approximately 70 tons of reinforcing bars also.

241 tons, state bridge, route 42, sections 14-D and 15-A, Camden county, New Jersey; bids Feb. 14; also approximately 700 tons of reinforcing bars.

115 tons, state highway bridge, Old Lyme, Conn.; bids Feb. 14 to Hartford, Conn.

100 tons, underpass, Brunswick, Me.; bids Feb. 15, Augusta, Me.

100 tons, two heavy gates and miscellaneous, Haystack dam, Descutes project, Oregon; bids to the Bureau of Reclamation, Madras, Oreg., Feb. 23.

REINFORCING BARS . . .

REINFORCING BARS PLACED

1175 tons, nine grade separation structures and highway section, Connecticut turnpike, Stamford-Darien, Conn., Project 305-01, to Igoe Bros. Inc., Newark, N. J.; Peter W. Kero Inc., Carlstadt, N. J., general contractor; 500 tons, mat reinforcing to Igoe Bros. Inc.

875 tons, seven grade separations, Connecticut turnpike, Stratford-Milford, Conn., Project 313-03, to Truscon Steel Division, Republic Steel Corp., Boston; D. V. Frione & Co. Inc., New Haven, general contractor; 665 tons, steel piles, to Bethlehem Steel Co., Bethlehem, Pa.; 1300 tons, fabricated structural steel to Schacht Structural Steel Co., New York.

300 tons, bars and structurals, industrial development, Berkeley Airport, Cumberland, R. I., to Plantations Steel Co., Providence, R. I.; Gilbane Building Co., Providence, general contractor; structurals, Rumford Steel Products Inc., Providence.

300 tons, Washington state Thurston county project, to Soule Steel Co., Seattle; J. E. Alexander, Seattle, general contractor, low at $272,317.

240 tons, Elmendorf Air Base, Alaska, dormitories, to Northwest Steel Rolling Mills Inc., Seattle; Kuney-Johnson Co., Seattle, general contractor.

200 tons, four 3-span beam highway bridges, Manchester, N. H., to Bancroft & Martin Rolling Mills Co., South Portland, Me.; E. D. Swett Inc., Winchester, N. H., general contractor; 460 tons, steel piles, to Bethlehem Steel Co., Bethlehem, Pa.

192 tons, Roza project power house, to Northwest Steel Rolling Mills Inc., Seattle; Hall-Atwater Co., Seattle, general contractor.

166 tons, Washington state highway spans, Spokane county, to Northwest Steel Rolling Mills Inc., Seattle; C. A. Power, Spokane, general contractor.

150 tons, warehouse for Sick's brewery, Seattle, to Northwest Steel Rolling Mills Inc., Seattle; J. H. Sellen Construction Co., Seattle, general contractor.

145 tons, science building, Brandeis University, Waltham, Mass., to Northern Steel Inc., Medford, Mass.; George A. Fuller Co., Boston, general contractor.

REINFORCING BARS PENDING

1965 tons, substructure, Bridgeport Harbor bridge, Connecticut turnpike, Project 311-01; A. F. Wikstrom Inc., Skaneatles, N. Y., low on general contract; also 5950 tons, steel piles, including 625 tons with points.

1800 tons, section, Schuylkill expressway, Philadelphia; Lipsett Co., New York, low on general contract.

825 tons, bridge substructure, Connecticut turnpike, New Haven, Conn., Project 317-02; also 925 tons of steel piles.

100 tons plus, two Idaho state canal bridges, Canyon county; general contract to J. H. Wise & Sons, Boise, low at $109,514.

100 tons plus, 141-ft Idaho state bridge, Twin Falls county; general contract to Aslett Construction Co., Twin Falls, low at $127,042.

PLATES . . .

PLATES PLACED

300 tons, two floating pile drivers for the Navy; general contract to the Todd Shipyard Corp.'s Seattle Division.

100 tons, 100,000-gallon water storage tank, Notus, Idaho, to Pittsburgh-Des Moines Steel Co., low at $29,750.

PLATES PENDING

7000 to 8000 tons, penstocks; two Snake river dams for Idaho Power Co.; awards expected soon; Morrison-Knudsen Co., Boise, Idaho, general contractor.

3000 tons, canal and laterals near Epharta, Wash.; early award expected by the U. S. Engineer.

306 tons, two floating pile drivers for the Navy, for construction by the Todd Shipyards Corp., New York; 162 tons of structural shapes also required.

200 tons, addition to Snoqualmie power plant, near Seattle, of Puget Sound Power & Light Co.; Stone & Webster, Boston, prime contractor.

120 tons, 1,000,000-gallon steel standpipe; bids to Georgiana Russell, clerk, Othello, Wash., Feb. 16.

PIPE . . .

CAST IRON PIPE PLACED

174 tons, system expansion, Eugene, Oreg., to Pacific States Cast Iron Pipe Co., Portland, Oreg.

STEEL PIPE PLACED

554 tons, 48-in. pipe, Vine street extension, Philadelphia, a state project, through Lipsett Co., New York, general contractor, to Alco Products Inc., New York.

RAILS, CARS . . .

RAILROAD CARS PLACED

Atchison, Topeka & Santa Fe, 700 seventy-ton hoppers, to General American Transportation Corp., Chicago; 100 fifty-ton boxcars to ACF Industries, New York.

Chicago & Eastern Illinois, 200 seventy-ton hoppers, to ACF Industries, New York.

Chicago Great Western, 25 seventy-ton covered hoppers, to General American Transportation Corp., Chicago.

Chicago, Milwaukee, St. Paul & Pacific, 1100 freight cars, 1000 fifty-ton boxcars going to the ACF Industries, New York, and 50 seventy-ton refrigerator cars and 50 fifty-ton insulated boxcars to the Pacific Car & Foundry Co., Renton, Wash.

Chicago & Northwestern, 25 caboose cars, to International Railway Car Co., Kenton, O.

Chicago & Northwestern, 16 double-deck suburban coaches, to Pullman-Standard Car Mfg. Co., Chicago.

Chicago, Rock Island & Pacific, 50 fifty-ton boxcars, to ACF Industries, New York.

Detroit & Mackinac, 75 fifty-ton boxcars and 25 seventy-ton hoppers, to the General American Transportation Corp., Chicago.

Elgin, Joliet & Eastern, 200 seventy-ton gondolas, to the Greenville Steel Car Co., Greenville, Pa.

Pacific Fruit Express Co., 1800 standard refrigerator cars and 200 mechanically refrigerated cars, to its own shops.

Pacific Great Eastern, five self-propelled, 80-passenger rail coaches, to unstated interests by British Columbia officials.

Southern Pacific, 21 double-deck commuter coaches, to ACF Industries Inc., New York.

Southern Railways, 15 ninety-ton depressed center flatcars, to the Thrall Car Co., Chicago.

St. Louis-Southwestern, 200 seventy-ton gondolas, to the Bethlehem Steel Co., Bethlehem, Pa.

Union Railroad, 500 fifty-ton hopper car bodies and 50 seventy-ton gondolas, to the Greenville Steel Car Co., Greenville, Pa.

Union Tank Car Co., 1260 tank cars, including 220 aluminum cars, to its own shops.

Western Maryland, 650 freight cars, 500 seventy-ton hoppers going to the Bethlehem Steel Co., Bethlehem, Pa., and 150 seventy-ton covered hoppers going to the Greenville Steel Car Co., Greenville, Pa.

Western Pacific, 25 fifty-ton flatcars, to Thrall Car Co., Chicago.

Toronto, Hamilton & Buffalo, 50 seventy-ton mill type gondolas, to the National Steel Car Corp.

RAILS PENDING

Alaska Railroad, frogs and switches, $136,000 value, for Seward, Alaska, terminals; bids to General Services Administration, Seattle, Feb. 7.

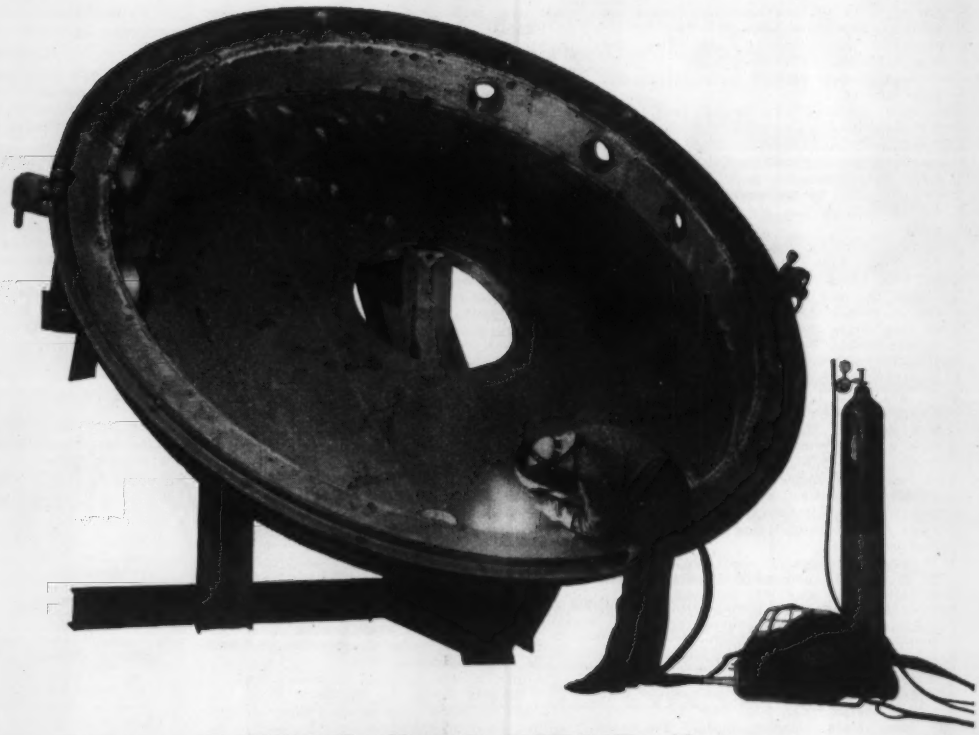
Steel Import Prices

(Base per 100 lb. landed, duty paid. Source of shipment: Western continental European countries)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A-305	$6.80	$6.80	$6.80	$7.20
Bar Size Angles	6.80	6.80	6.80	7.20
Structural Angles	6.80	6.80	6.80	7.20
I-Beams	7.00	7.00	7.00	7.40
Wide Flange Beams	7.00	7.00	7.00	7.40
Plates	8.50*	8.50*	8.50*	8.90*
Sheets, H.R.	9.00	9.00	9.00	9.40
Furring Channels, C.R., 1000 ft. ¾ x 0.30 lb per ft	28.43	28.43	28.43	30.26
Barbed Wire (†)	6.10	6.10	6.10	6.45
Merchant Bars	7.10*	7.10*	7.10*	7.50*
Hot-Rolled Bands	7.10*	7.10*	7.10*	7.50*
Wire Rods, Thomas Commercial No. 5	6.25	6.25	6.25	6.65
Wire Rods, O-H Cold Heading Quality No. 5	6.75	6.75	6.75	7.15
Bright Common Wire Nails	7.50	7.50	7.50	7.90

Oil Country Pipe: Prices on all sizes equalized with Pittsburgh plus barge freight to New Orleans and Houston, where available.

*Nominal. †Per 82-lb. net, reel. ‡Per 100-lb kegs, 20d nails and heavier.



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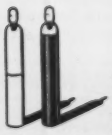
Aircomatic welding is an inert-gas, shielded arc process using a a consumable wire electrode. The basic unit, manual or automatic, designed and manufactured by Airco, includes the welding head, carriage assembly for wire drive and control equipment, cables, hoses, and flexible wire casing.

The consumable wire electrode is produced to rigid Airco specifications as to purity, cast, and metallurgical content. Normally supplied on expendable spools, Aircomatic wire is available in aluminum, steel, stainless steel, nickel, titanium, copper, and copper base alloys.



Airco shielding gases include both helium and argon, produced by Airco, or mixtures thereof for particular requirements. Pure carbon dioxide gas is also available from Airco for use as a shielding medium where applicable.

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In Cuba — Cuban Air Products Corporation

In Canada — Air Reduction Canada Limited

Products of the divisions of Air Reduction Company, Incorporated, include: **AIRCO** — industrial gases, welding and cutting equipment, and acetylenic chemicals • **PURECO** — carbon dioxide, liquid-solid ("DRY-ICE") • **OHIO** — medical gases and hospital equipment • **NATIONAL CARBIDE** — pipeline acetylene and calcium carbide • **COLTON** — polyvinyl acetates, alcohols, and other synthetic resins.

Scrap . . .

Scrap Prices, Page 186

Philadelphia — Purchases by the Fairless Hills, Pa., mill forced the market on open hearth steel scrap down $2 a ton. No. 1 heavy melting, No. 1 bundles and No. 1 busheling are holding at $53, delivered; No. 2 heavy melting at $47; and No. 2 bundles at $44. This mill also bought some No. 1 cupola cast at $53, delivered, unchanged. Export prices on open-hearth grades are off about $2.50 a ton.

New York—Following recent sharp increases and with some brokers out of the market, scrap prices are off substantially. Brokers' buying prices are around $45-$46 for No. 1 heavy melting and No. 1 bundles; $42-$43 for No. 2 heavy melting; and $36-$38 for No. 2 bundles. Machine shop turnings are $26-$27; mixed borings and turnings $29-$30; short shovel turnings $30-$31; and low phos structural and plate $48-$50. Cast grades are unchanged.

Boston — Steel scrap prices are softer, several grades being off $2 a ton. Cast grades are also lower. For district consumption, brokers are paying $45, shipping point, for No. 1 heavy melting, off $3 from the recent high level. The decline is even sharper on heavy melting for eastern Pennsylvania delivery, No. 2 grade especially.

Pittsburgh—A mill on the fringe of the Pittsburgh district purchased a small amount of scrap at prices equivalent to $50 for No. 1 heavy melting and $45 for No. 2 heavy melting. In the absence of other activity, this established the market. Turnings and borings also dropped $1 last week. Cast iron grades are firm, as is railroad scrap.

Buffalo—Cast scrap prices are off $1 a ton here, but steelmaking grades are nominally unchanged. Easier tendencies in other consuming areas are expected to be reflected here, but dealers point out that local prices did not keep pace with an upsurge at other points early in January.

Cleveland—Scrap prices continue to slip, being off $1.50 on the steelmaking grades in sales to a local mill. The steelmaking grades are quoted here at $50-$51, delivered. In the Valley, No. 1 heavy melting is quoted at $52.50-$53.50, but this price is largely nominal in the absence of representative sales. Automotive lists brought $9 to $10 under the prices paid a month ago, with No. 2 production bundles bringing around $52. A month ago $61 was paid for such material.

Cincinnati—Further easing in the scrap market is noted. Prices are off about $1 per ton on most grades.

Chicago—Volumewise, the scrap market here is not particularly active, but prices on the steelmaking grades have continued stable. One sign of stability is that prices brokers are offering dealers are only $1 a ton less than current mill sales, compared with $2 and $3 less just before the recent price adjustment. Principal new weakness is in the turnings and borings grades, which are off $2 a ton and considered nominal. Several cast grades have declined $1 a ton.

Detroit—The local scrap market is resisting the weakness showing up in other areas. This relative strength is due to the smaller amount of scrap coming onto the market from the auto plants.

St. Louis—Prices continue weak. Plenty of scrap is moving to local mills.

San Francisco—Downward readjustments in steel scrap prices are expected.

Seattle—Scrap prices here are expected to decline $2 a ton on No. 1 (down to $46) and No. 2 heavy melt-

(*Please turn to page* 188)

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Iron and Steel Scrap

Consumer prices, per gross ton, except as otherwise noted, including broker's commission, as reported to STEEL. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

Feb. 1	$50.50
Jan. 25	51.50
Jan. Avg.	52.17
Feb. 1955	36.79
Feb. 1951	44.00

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

PITTSBURGH

No. 1 heavy melting	*49.00-50.00*
No. 2 heavy melting	*44.00-45.00*
No. 1 bundles	*49.00-50.00*
No. 2 bundles	*41.00-42.00*
No. 1 busheling	*49.00-50.00*
Machine shop turnings	*35.00-36.00*
Mixed borings, turnings	*35.00-36.00*
Short shovel turnings	*38.00-39.00*
Cast iron borings	*38.00-39.00*
Cut structurals, 3 ft lengths	*58.00-59.00*
Heavy turnings	*45.00-46.00*
Punchings & plate scrap	*58.00-59.00*
Electric furnace bundles	*53.00-54.00*

Cast Iron Grades

No. 1 cupola	48.00-49.00
Charging box cast	45.00-46.00
Heavy breakable cast	45.00-46.00
Unstripped motor blocks	32.00-33.00
No. 1 machinery cast	54.00-55.00

Railroad Scrap

No. 1 R.R. heavy melt.	59.00-60.00
Rails, 2 ft and under	68.00-69.00
Rails, 18 in. and under	69.00-70.00
Rails, random lengths	64.00-65.00
Railroad specialties	63.00-64.00

Stainless Steel Scrap

18-8 bundles & solids	340.00-355.00
18-8 turnings	235.00-245.00
430 bundles & solids	110.00-120.00
430 turnings	60.00-65.00

CLEVELAND

No. 1 heavy melting	*50.00-51.00*
No. 2 heavy melting	44.00-45.00
No. 1 bundles	*50.00-51.00*
No. 2 bundles	*38.00-39.00*
No. 1 busheling	*50.00-51.00*
Machine shop turning	30.00-31.00
Mixed borings, turnings	34.50-35.50
Short shovel turnings	34.50-35.50
Cast iron borings	34.50-35.50
Low phos.	55.00-56.00
Cut structural plates 2 ft and under	*59.00-60.00*
Alloy free, short shovel turnings	37.00-38.00
Electric furnace bundles	*50.50-51.50*

Cast Iron Grades

No. 1 cupola	*55.00-56.00*
Charging box cast	*47.00-48.00*
Stove plate	*53.00-54.00*
Heavy breakable cast	*46.00-47.00*
Unstripped motor blocks	*36.00-37.00*
Brake shoes	*41.00-42.00*
Clean auto cast	*53.00-54.00*
Burnt cast	*41.00-42.00*
Drop broken machinery	*55.00-56.00*

Railroad Scrap

No. 1 R.R. heavy melt.	55.00-56.00
R.R. malleable	59.00-60.00
Rails, 2 ft and under	71.00-72.00
Rails, 18 in. and under	72.00-73.00
Rails, random lengths	65.00-66.00
Cast steel	60.00-61.00
Railroad specialties	60.00-61.00
Uncut tires	60.00-61.00
Angles, splice bars	66.00-67.00
Rails, rerolling	71.00-72.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	340.00-350.00
18-8 turnings	200.00-210.00
430 clips, bundles, solids	105.00-115.00
430 turnings	55.00-65.00

YOUNGSTOWN

No. 1 heavy melting	*52.50-53.50*
No. 2 heavy melting	*44.00-45.00*
No. 1 bundles	*52.50-53.50*
No. 2 bundles	*39.00-40.00*
No. 1 busheling	*52.50-53.50*
Machine shop turnings	*31.50-32.50*
Short shovel turnings	*36.00-37.00*
Cast iron borings	*36.00-37.00*
Low phos.	*54.00-55.00*
Electric furnace bundles	*54.00-55.00*

Railroad Scrap

No. 1 R.R. heavy melt.	57.00-58.00

CHICAGO

No. 1 heavy melting	48.00-50.00
No. 2 heavy melting	*37.00-38.00*
No. 1 dealer bundles	47.00-48.00
No. 1 factory bundles	50.00-51.00
No. 2 bundles	37.00-38.00
No. 1 busheling	48.00-50.00
Machine shop turnings	*27.00-28.00*
Mixed borings, turnings	*29.00-30.00*
Short shovel turnings	*29.00-30.00*
Cast iron borings	*29.00-30.00*
Cut structurals, 3 ft	*54.00-55.00*
Punchings & plate scrap	*55.00-56.00*

Cast Iron Grades

No. 1 cupola	*48.00-49.00*
Stove plate	40.00-41.00
Unstripped motor blocks	38.00-39.00
Clean auto cast	*53.00-54.00*
Drop broken machinery	*53.00-54.00*

Railroad Scrap

No. 1 R.R. heavy melt.	51.00-52.00
R.R. malleable	62.00-63.00
Rails, 2 ft and under	67.00-68.00
Rails, 18 in. and under	68.00-69.00
Angles, splice bars	65.00-66.00
Rails, rerolling	*68.00-70.00*

Stainless Steel Scrap

18-8 bundles & solids	335.00-350.00
18-8 turnings	240.00-250.00
430 bundles & solids	110.00-115.00
430 turnings	50.00-55.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*47.00*
No. 2 heavy melting	*35.00*
No. 1 bundles	*47.00*
No. 2 bundles	*35.00*
No. 1 busheling	*47.00*
Machine shop turnings	23.00
Mixed borings, turnings	23.00
Short shovel turnings	27.00
Punchings & plate scrap	55.00

Cast Iron Grades

No. 1 cupola	43.00
Charging box cast	37.00
Stove plate	37.00
Heavy breakable	35.00
Unstripped motor blocks	25.00
Clean auto cast	46.00
Malleable	42.00

BIRMINGHAM

No. 1 heavy melting	45.00-46.00
No. 2 heavy melting	42.00-43.00
No. 1 bundles	45.00-46.00
No. 2 bundles	34.00-35.00
No. 1 busheling	45.00-46.00
Cast iron borings	19.00-20.00
Short shovel turnings	30.00-31.00
Machine shop turnings	29.00-30.00
Electric furnace bundles	48.00-49.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	47.50-48.00
Stove plate	44.50-45.50
Bar crops and plate	54.00-55.00
Structural & plate, 2 ft	54.00-55.00
Unstripped motor blocks	39.00-40.00
Charging box cast	32.00-33.00
No. 1 wheels	39.00-40.00

Railroad Scrap

No. 1 R.R. heavy melt.	51.00-52.00
Rails, 18-in. and under	64.00-65.00
Rails, rerolling	64.00-65.00
Rails, random lengths	59.00-60.00
Angles, splice bars	61.00-62.00

PHILADELPHIA

No. 1 heavy melting	*53.00*
No. 2 heavy melting	*47.00*
No. 1 bundles	*53.00*
No. 2 bundles	*44.00*
No. 1 busheling	*53.00*
Electric furnace bundles	*54.00*
Machine shop turnings	*37.50*
Mixed borings, turnings	*37.50*
Short shovel turnings	*40.00†*
Heavy turnings	*49.00†*
Structurals & plate	*58.00-59.00*
Couplers, springs, wheels	*59.00-60.00†*
Rail crops, 2 ft & under	*66.00†*

Cast Iron Grades

No. 1 cupola	52.00-53.00
Malleable	68.00
Heavy breakable cast	*53.00*
Drop broken machinery	*53.00*

†Nominal

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*45.00-46.00*
No. 2 heavy melting	*42.00-43.00*
No. 1 bundles	*45.00-46.00*
No. 2 bundles	*36.00-38.00*
Machine shop turnings	*26.00-27.00*
Mixed borings, turnings	*29.00-30.00*
Short shovel turnings	*30.00-31.00*
Low phos. (structural & plate)	*48.00-50.00*

Cast Iron Grades

No. 1 cupola	47.00-48.00
Unstripped motor blocks	32.00-33.00
Heavy breakable	46.00-47.00

Stainless Steel

18-8 sheets, clips solids	320.00-325.00
18-8 borings, turnings	150.00-160.00
430 sheets, clips, solids	120.00-125.00
410 sheets, clips, solids	100.00-105.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*45.00-45.50*
No. 2 heavy melting	*35.00-35.50*
No. 1 bundles	*43.50-44.00*
No. 2 bundles	*32.50-33.00*
Machine shop turnings	*26.00-26.50*
Mixed borings, turnings	*27.00-27.50*
Short shovel turnings	*23.00-23.50*
No. 1 cast	47.00-47.50
Mixed cupola cast	44.00-44.50
No. 1 machinery cast	49.00-49.50

BUFFALO

No. 1 heavy melting	47.00-48.00
No. 2 heavy melting	43.00-44.00
No. 1 bundles	47.00-48.00
No. 2 bundles	40.00-41.00
No. 1 busheling	47.00-48.00
Mixed borings, turnings	33.00-34.00
Machine shop turnings	31.00-32.00
Short shovel turnings	35.00-36.00
Cast iron borings	35.00-36.00
Low phos.	49.00-50.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	*46.00-47.00*
No. 1 machinery	*49.00-50.00*

Railroad Scrap

Rails, random lengths	58.00-59.00
Rails, 3 ft and under	60.00-61.00
Railroad specialties	51.00-52.00

CINCINNATI

(Brokers' buying prices; f.o.b. shipping point)

No. 2 heavy melting	*45.00-46.00*
No. 2 heavy melting	*39.00-40.00*
No. 1 bundles	*45.00-46.00*
No. 2 bundles	*37.00-38.00*
No. 1 busheling	*45.00-46.00*
Machine shop turnings	*30.50*
Mixed borings, turnings	*30.50-31.00*
Short shovel turnings	*33.50*
Cast iron borings	*30.50-31.00*
Low phos., 18 in.	*55.00-56.00*

Cast Iron Grades

No. 1 cupola	*45.00-46.00*
Heavy breakable cast	*43.00-44.00*
Charging box cast	*43.00-44.00*
Drop broken machinery	*55.00-56.00*

Railroad Scrap

No. 1 R.R. heavy melt.	*52.00-53.00*
Rails, 18 in. and under	*66.00-67.00*
Rails, random lengths	*59.00-60.00*

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	40.50
No. 2 heavy melting	38.00
No. 1 bundles	40.50
No. 2 bundles	34.00
No. 1 busheling	40.50
Machine shop turnings	28.00
Short shovel turnings	28.00

Cast Iron Grades

No. 1 cupola	47.00
Charging box cast	41.00
Heavy breakable cast	39.00
Unstripped motor blocks	39.00
Brake shoes	43.00
Clean auto cast	48.00
Stove plate	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	50.50
Rails, 18 in. and under	66.00
Rails, random lengths	60.00
Rails, rerolling	68.00
Angles, splice bars	*56.00*

SEATTLE

No. 1 heavy melting	*46.00*
No. 2 heavy melting	*42.00*
No. 1 bundles	40.00
No. 2 bundles	38.00
No. 3 bundles	25.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	15.00-16.00
Electric furnace, bundles	55.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	50.00
Heavy breakable cast	40.00
No. 1 wheels	35.00
Unstripped motor blocks	33.00
Clean motor blocks	40.00
Stove plate (f.o.b. plant)	35.00
Brake shoes	35.00

Railroad Scrap

Rails, random lengths	33.00

LOS ANGELES

No. 1 heavy melting	42.00
No. 2 heavy melting	38.00
No. 1 bundles	41.00
No. 2 bundles	33.00
Machine shop turnings	20.00

Cast Iron Grades (F.o.b. shipping point)

No. 1 cupola	48.00

SAN FRANCISCO

No. 1 heavy melting	44.00
No. 2 heavy melting	42.00
No. 1 bundles	44.00
No. 2 bundles	38.00
No. 1 busheling	44.00
Machine shop turnings	23.00
Mixed borings, turnings	23.00
Cast iron borings	23.00
Short shovel turnings	25.00
Cut structurals	46.00
Heavy turnings	25.00
Punchings & plate scrap	44.00

Cast Iron Grades

No. 1 cupola	50.00
Charging box cast	35.00
Stove plate	39.00
Heavy breakable cast	36.00
Unstripped motor blocks	32.00
Brake shoes	35.00
Clean auto cast	50.00
No. 1 wheels	39.00
Burnt cast	23.00
Drop broken machinery	50.00

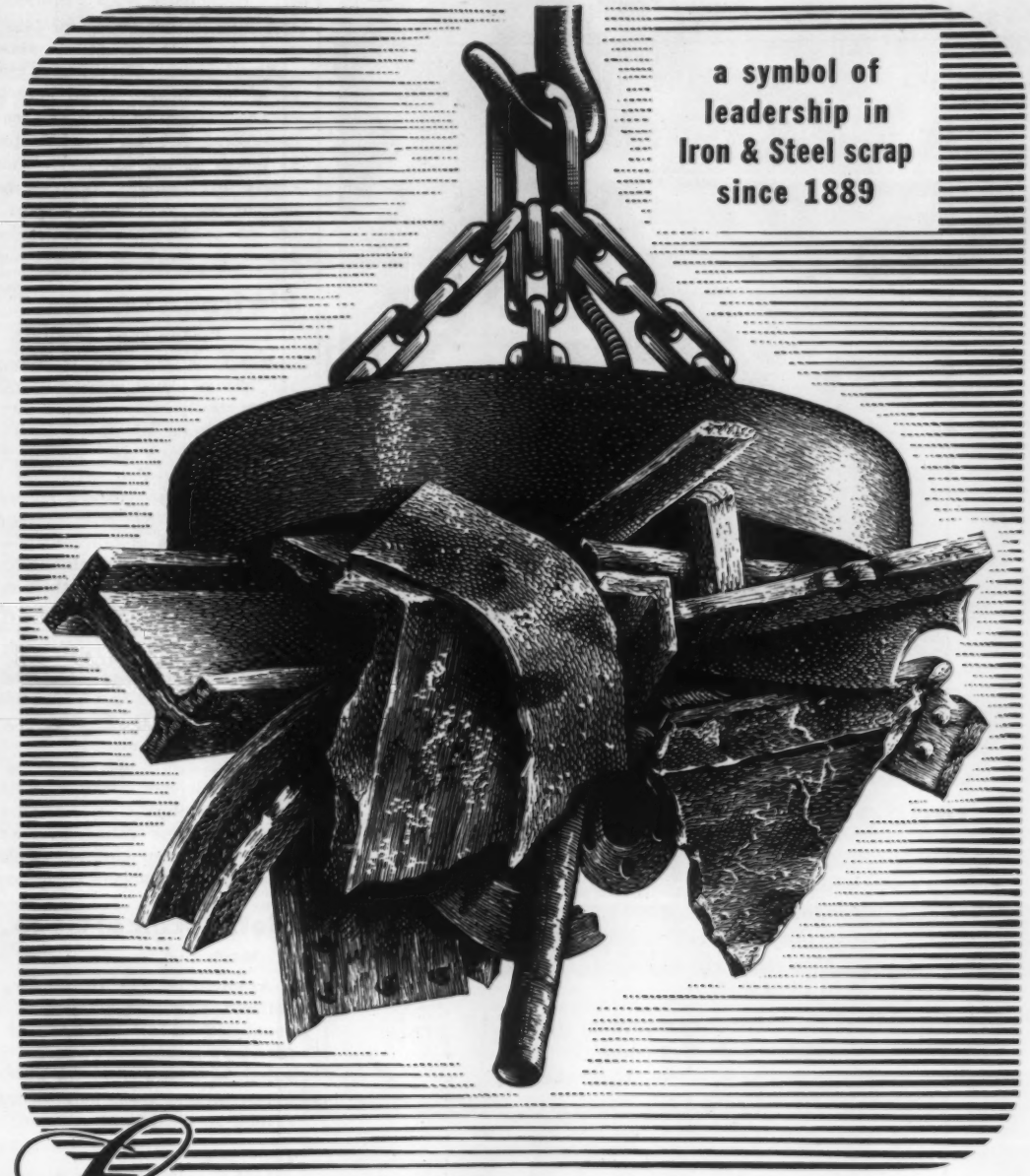
HAMILTON, ONT.

No. 1 heavy melting	45.50
No. 2 heavy melting	41.50
No. 1 bundles	45.50
No. 2 bundles	38.00
Mixed steel scrap	38.00
Mixed borings, turnings	19.00
Rails, remelting	54.50
Busheling, new factory: Prepared	43.50
Unprepared	39.50
Short steel turnings	27.50

Cast Iron Grades†

No. 1 machinery cast	42.00-45.00

†F.o.b., shipping point.



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(*Concluded from page* 185)

ing steel grades (down to $42). Export business is at a standstill.

Birmingham—The largest consumer of open-hearth scrap here is out of the market. The Atlanta mill, however, last week bought a tonnage at prices $2 per ton under those recently prevailing. Scrap is flowing well at the lower level. Export brokers at some points are completely out of the market.

Pig Iron . . .

Pig Iron Prices, Page 173

Merchant pig iron is moving at the highest level since last fall and substantially higher than a year ago. Some is going into inventories. Most consumers look for higher freight rates late in February and would not be surprised to see higher base prices on pig iron soon thereafter.

The cutback in automobile assemblies is not affecting demand for iron. Generally, there is a little less pressure, but it isn't disturbing sellers. One farm implement maker in the Midwest, hit by a strike, has deferred some tonnage. Demand from soil pipe makers is off seasonally.

On the West Coast, one large firm has ordered an unstated tonnage of iron from South Africa. This metal can be delivered about $3 a ton under the domestic price. Australian exporters have failed to make delivery on firm contracts, claiming shipping licenses were not procurable.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 181

A slight easing in foundry coke demand is observed, but it is not construed as an indicator of lower foundry operations. Some of the softening comes from the automobile industry, and even here it isn't regarded as significant.

Warehouse . . .

Warehouse Prices, Page 173

Changes in mill extras on carbon plates and hot-rolled sheet and strip will be reflected soon in warehouse price schedules. Further upward revision in prices will follow the rise in freight rates which probably will be effective later this month.

Distributors' business is well sustained; it looks solid for the first quarter. An expected easing in hot-rolled and cold-rolled sheets has not materialized.

Structural steel and heavy plate shipments from mills have been brought nearer to promised delivery dates, but these products will be no easier to obtain in March or April.

CLASSIFIED

Representatives Wanted

MANUFACTURERS REPRESENTATIVE calling on steel fabricators in Mid-West to replace representative who is retiring. Our machinery has 25-year history in both large and small structural shops—also manufacturing plants. Exclusive contract to organization selected. Will consider machine tool distributor or dealer. Address Box 371, STEEL, Penton Bldg., Cleveland 13, Ohio.

Help Wanted

GENERAL FOREMAN to take complete charge Job Galvanizing shop in Delaware Valley Area. Must have hot-dip galvanizing experience and at least five years' supervisory experience. Good opportunity for right man. Send resume to Box 363, STEEL, Penton Bldg., Cleveland 13, Ohio.

PRODUCTION SUPERINTENDENT
Leading tool steel manufacturer seeks Production Superintendent experienced in maintenance or production in Merchant Rolling Mills. Minimum of three to five year experience and a mechanical or metallurgical education desired. Complete employee benefits and excellent advancement opportunities. Send full resume to Box 367, STEEL, Penton Bldg., Cleveland 13, Ohio.

SUPERINTENDENT OF BILLET CONDITIONING
Leading tool steel manufacturer seeks superintendent of billet conditioning with several years experience on work involving conditioning of billets. Must be able to develop better grinding techniques and be capable of handling personnel in a department of approximately 150 people. Complete employee benefits and excellent advancement opportunities. Send full resume to Box 368, STEEL, Penton Bldg., Cleveland 13, Ohio.

MULTI-PLANT, WIDELY DIVERSIFIED ORGANIZATION HAS OPENING FOR STEEL SALES ENGINEER IN EAST CENTRAL STATES. EXPERIENCE IN PRODUCT AND MARKET DEVELOPMENT ESSENTIAL. EXPERIENCE IN FABRICATION PRACTICES AND IN APPLICATION OF MERCHANT BARS AND SHAPES DESIRABLE. AGE RANGE 35 TO 45. SUCCESSFUL APPLICANT MAY BE CANDIDATE FOR TOP SALES MANAGEMENT IN FORESEEABLE FUTURE. ALL REPLIES WILL BE HELD IN STRICTEST CONFIDENCE. WRITE BOX 369, STEEL, PENTON BLDG., CLEVELAND 13, OHIO.

ESTIMATOR experienced in material take-off for 34-year old structural steel fabricator located in Pittsburgh, Pa., district. Expanding our staff, and our employees know about this ad. All replies held confidential, and please send full resume. Address Box 370, STEEL, Penton Bldg., Cleveland 13, Ohio.

UNDISPLAYED CLASSIFIED RATES

ALL CLASSIFICATIONS
Other than "Positions Wanted"

	Set Solid	All Capitals	All Caps Leaded
50 words or less	$15.00	$19.20	$23.40
Each additional word	.30	.38	.47

POSITIONS WANTED

25 words or less	$ 3.60	$ 4.80	$ 5.40
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Cash with order necessary on "Positions Wanted"

Keyed address takes seven words. Replies forwarded without charge.

All classified pages are 3 columns, each column 2¼".

Forms close 10 days prior to publication date.

STEEL *The Weekly Magazine of Metalworking*
Penton Building, Cleveland 13, Ohio

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Send blueprints for prompt quotation.
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Write, telegraph urgently, or call collect.

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New York City
Circle 7-4387

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1—PAYOFF REEL, WITH DRAG BRAKE OR EQUIVALENT, MANUAL OR POWER, FOR 16" I.D. COILS, 36" O.D. MAXIMUM, 1200 LB. MAXIMUM COIL SIZE.

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EXCELLENT OPPORTUNITY FOR MAN OF DEMONSTRATED ABILITY WHO HAS HAD EXPERIENCE IN ROLLING MILL OPERATION EITHER FERROUS OR NONFERROUS. REPLY IN CONFIDENCE TO

BOX 365, STEEL
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CLASSIFIED

Positions Wanted

SHOP SUPERINTENDENT
Age 35. Fifteen years' experience miscellaneous and structural steel fabrication, some ornamental. With a full knowledge shop practices; ability to handle planning and supervision. Knowledge of welding procedures and codes. Midwest vicinity. Reply Box 364, STEEL, Penton Bldg., Cleveland 13, Ohio.

DROP FORGE SUPERINTENDENT
35 years' experience in all phases of forging operations. Boards to 7500 Stearns to 15,000 Upsetters to 7½ inch. Capable of managing small plant. Reply Box 366, STEEL, Penton Bldg., Cleveland 13, Ohio.

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SALARIED POSITIONS $5,000 to $35,000. We offer the original personal employment service (established 46 years). Procedure of highest ethical standards is individualized to your personal requirements. Identity covered: present position protected. Ask for particulars. R. W. BIXBY, INC., 565 Brisbane Bldg., Buffalo 3, N.Y.

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ECA QUALITY REBUILTS

Manitowoc Crane, 50-60T., serial No. 3520. Equipped with 70' boom, powered by Caterpillar D-17000 diesel, crawler mounted. ECA rebuilt.

Unit Wagon Crane, 10-15T., Model 1020. Self-propelled, 40' boom, mounted on 12 pneumatic tired carrier, hydraulic steering, air brakes. Completely rebuilt.

Industrial Brownhoist Locomotive Crane, 35-40T., Model 8, serial No. 11401, 50' boom, powered with Caterpillar D-13000 diesel. Capacity at 12' radius, 70,000 lbs. without outriggers, 84,000 lbs. with outriggers. ECA rebuilt.

American Derrick, 50 T., Model 4-100. Equipped with 120' mast, 110' boom, steel erectors guy derrick.

SKAGIT Hoist, double drum, model BU-140 YD., 25,000 to 222,000 # line pull. Powered by 137 HP gasoline engine.

Please Contact Your Nearest ECA Office

EQUIPMENT CORP. OF AMERICA
PITTSBURGH 30, PA., Box A933, FEderal 1-2000
CLIFTON HGTS., PA., Box A608 Sub. of Phila., MAdison 6-2200
CHICAGO 4, ILL., 327A S. LaSalle St., WAbash 2-4661
NEW YORK 7, N. Y., 30A Church St., WOrth 2-0036

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Overseas Firm specializing in Deep Drawing and Metal Fabricating Industry, whose principals now in New York, interested in purchasing or leasing existing dies for manufacture of bathroom fixtures, cabinets, home appliances, containers, etc.

Contact
TRANSMUNDO COMPANY, INC.
9 Rockefeller Plaza
New York City
Circle 7-4387

INDUSTRIAL ENGINEERING OPPORTUNITIES

For QUALITY CONTROL ENGINEERS with training or experience in the field of process analysis and statistical analysis.

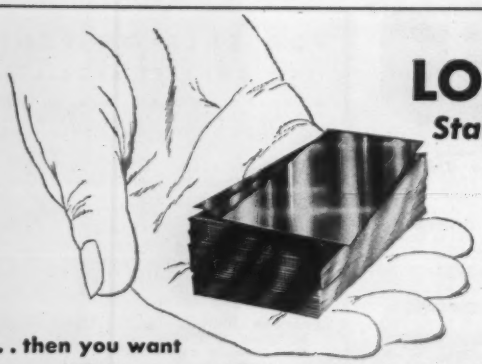
For PRODUCTION RESEARCH ENGINEERS who have experience in operational analysis, operating procedures development, material handling, product protection and materials research.

We may have the opening you are looking for to provide you with the opportunity to fully utilize your capacity and meet your needs in an expanding progressive organization.

Must be willing to relocate in SO. CALIF. at Fontana plant of the KAISER STEEL CORPORATION.

Send complete resume including education, experience and salary requirements to: Employment Manager.

KAISER STEEL CORPORATION
P. O. Box 217
Fontana, California



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MicroRold® 430 Sheet

MicroRold Type 430 is a straight chromium-stainless with a nominal composition of 17% chromium. Though it is less resistant to corrosion, it retains all of the other desirable qualities of stainless and has proven very satisfactory in a wide range of mild corrosion applications.

MicroRold 430 is the least expensive of all stainless types because it does not contain nickel. This results in a 7¾c per pound difference in base price between Type 430 and Type 302, the most popular higher grade stainless. A saving of $155 per ton is possible and is of merit to cost-conscious fabricators.

MicroRold Type 430 sheets are available in thicknesses .005" to .109" with 2B or 2D finishes; and in thicknesses .010" to .109" in No. 3, 4 and 7 finishes.

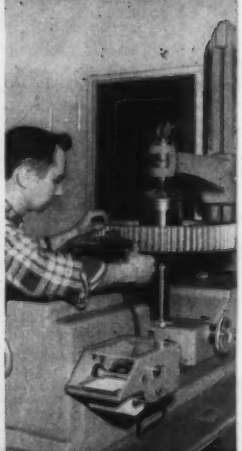
Send for your copy, "Care and Use of 430 Stainless".

Washington Steel *Corporation*

2-O WOODLAND AVE. WASHINGTON, PENNSYLVANIA

Another of the Reasons Behind Brad Foote Quality—

TOOTH SPACING



• 99% of gear drawings do not specify tooth spacing. For most applications, industry generally believes that competent gear manufacturers, working by standard AGMA practices, will produce gears within the limitations required for easy assembly and good load transmission.

• Occasionally, however, on very precise jobs you may find it necessary to specify extreme accuracy of tooth spacing and nonadjacent tooth spacing. Applications such as radar mounts, timing mechanisms, indexing mechanisms—all may require closer tooth spacing tolerances than are obtainable with average equipment in the hands of regular gear manufacturers.

• BRAD FOOTE welcomes precision jobs like these. We can add to highly specialized equipment specific experience in meeting this, as well as many other demanding requirements for special gear production.

• Prove to yourselves the savings that BRAD FOOTE quality can mean. Let us quote on the gear requirements for your next program.

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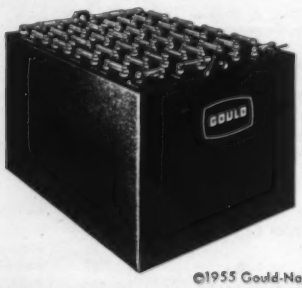

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GOULD

Batteries

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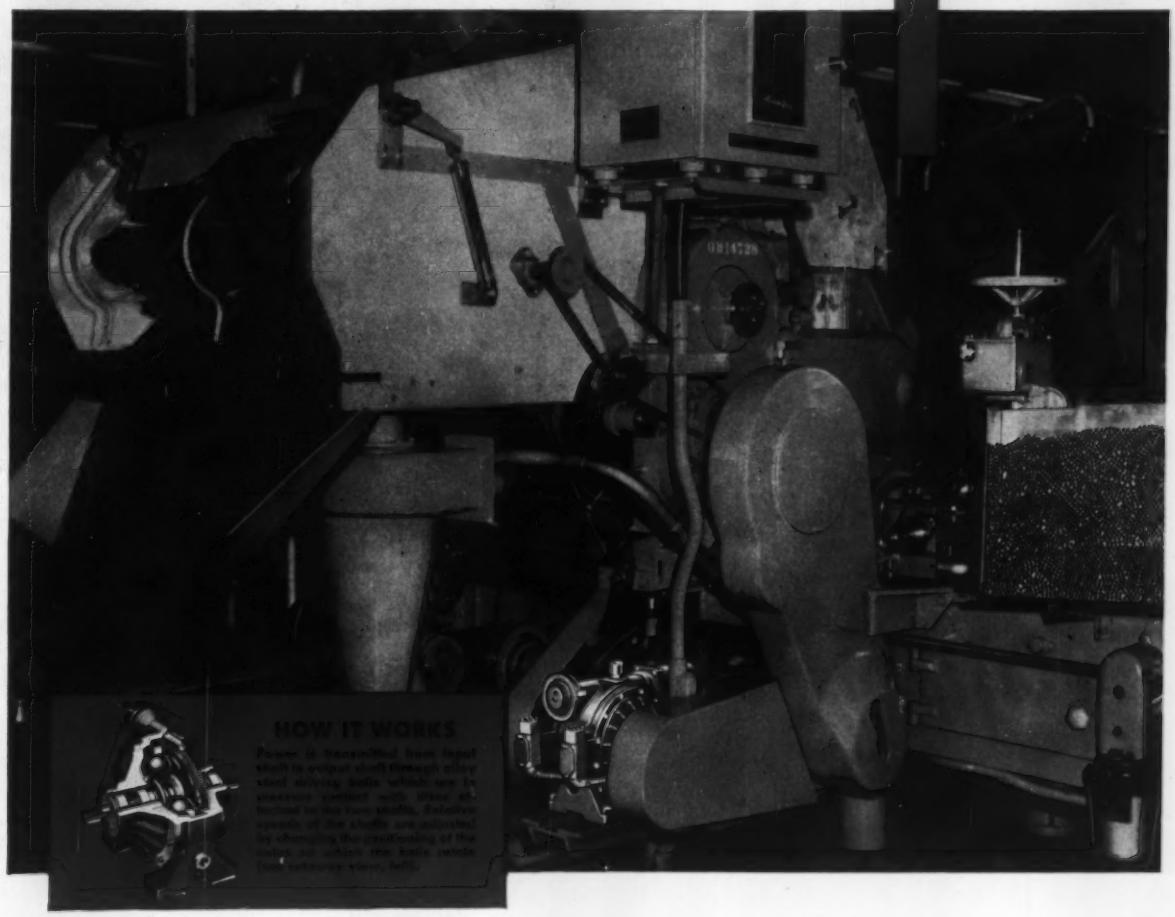
TRENTON 7, N. J.

"BETTER BATTERIES THROUGH RESEARCH"

Always Use Gould-National Automobile and Truck Batteries

AccuRay electronic brain gets muscle power from Cleveland Speed Variator

The electronic control mechanism of this cigarette machine, known as the AccuRay cigarette gage controller, built by Industrial Nucleonics Corp., Columbus, Ohio, employs Cleveland Speed Variator size 4K4, driven at 1200 rpm input.



NATIONALLY famous for checking and controlling the making of Chesterfield cigarettes, AccuRay depends on a Cleveland Speed Variator for the delicate job of adjusting the tobacco feed rate in response to impulses from the gaging mechanism.

Being infinitely variable, the Cleveland Speed Variator gives stepless speeds over a full 9:1 range — from ⅓ to 3 times input speed. Output speed on this application is adjusted automatically by a regulating motor mounted on the Variator — but could be regulated manually or by remote controls of other types.

Available in eighteen standard types and sizes, the Cleveland Speed Variator offers these major advantages: 1. An extremely compact unit with input and output shafts in line and rotating in the same direction; 2. Almost any input speed up to 1800 rpm can be used — either clockwise or counterclockwise rotation; 3. Rated for constant horsepower output over a 9:1 range, or for constant output torque with a 6:1 range; 4. Infinitely variable over the entire speed range; 5. Rapid response to speed change, precise adjustment, and accurate maintenance of speed settings; 6. Long life and minimum maintenance due to absence of belts or complicated linkages; 7. Ample bearing support for overhung pulleys on either input or output shafts.

Write for Bulletin K-200 for detailed description with photographs, sectional drawings, rating tables and specifications.

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Sales Representatives in all major industrial markets • In Canada — Peacock Brothers Limited

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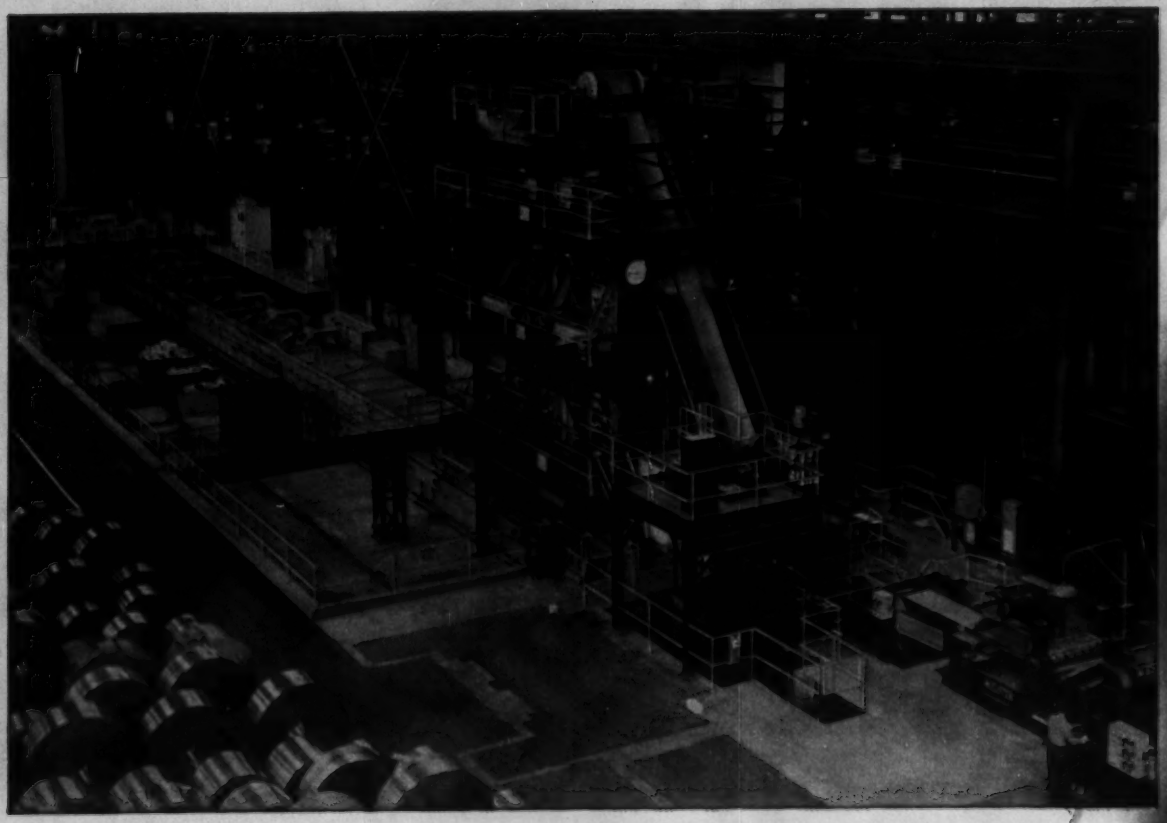

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